

TERWILLIGER FIRE

SUPPRESSION REPAIR PLAN DECEMBER 13TH, 2018

Randy Harbick Date
Fire Management Officer, McKenzie River Ranger District

Darren Cross Date
District Ranger, McKenzie River Ranger District

Tracy Beck Date
Forest Supervisor, Willamette National Forest

Prepared By: Tyson Cross Date
Lead Resource Advisors

TABLE OF CONTENTS

Introduction	4
Background	4
Purpose	4
Jurisdiction	4
Objectives.....	4
Responsibilities	5
Resource Information and Records	5
Repair Guidelines.....	6
Suppression Repair	6
Appendix A – Items Still Needing Repair	7
Appendix B – Additional Repair Prescriptions	19
Required Actions in All Fire Areas –	19
Repair of Trails Damaged by Fire suppression Activities –	19
Danger Tree Removal and All Fire Point and Line Repair	19
Emergency Consultation for endangered Species and Cultural Surveys	21
Appendix C – Suppression Repair Cost Summary	22
Appendix D – General Suppression Repair Prescriptions	23
Handlines	23
Dozer Lines.....	24
Stumps	25
Road Repair.....	25
Chipping	26
Heli-Pads	26
Ground Support / Staging at Strube Flats.....	27
Trail Repair	27
Recreation.....	27
Safety Zones, Drop Points and Staging Areas	28
Areas Within Robert Aufderheide Scenic Byway (FSR 19).....	29
Areas in the Wilderness	29
Revegetation Guidelines	31
Soil Stabilization	31
Cultural Resources	31
Appendix E – Completed Repair Work.....	32

Completed Repair Work.....	32
Appendix F – Resource Summary / Fire Suppression Best Practices.....	58
Appendix G – Repair Maps.....	62

INTRODUCTION

BACKGROUND

The Terwilliger Fire was detected on August 19th. The fire quickly grew beyond the capacity of the initial attack resources due to the dry forest conditions. As the fire spread and spotted into the Three Sisters Wilderness steep rugged terrain, dense vegetation, and unreliable access made containment impossible. A Type 3 Incident Management Team was ordered and then transitioned to a Type 2 team immediately.

The Terwilliger Fire reached 11,555 acres and burned on the west and east sides of Cougar Reservoir. The eastern portion of the fire is burning in the Three Sisters Wilderness between Sawtooth Ridge and Rebel Creek. To the west, the fire is comprised of two incidents. To the north, the fire established between Rider Creek and Rush Creek. To the South, the fire burned between Cougar Crossing and Star Creek, butting up against the 2017 Rebel Fire. Containment strategies included the construction of containment line features, falling dead standing trees, removing lower limbs, small trees and underbrush, and aerial support. As the fire continued to spread towards both mixed ownership land to the west and further into the Three Sisters Wilderness the combination of challenging terrain and dense mixed conifer vegetation made this fire resistant to containment. As expected this was a long term event that continued to burn until significant moisture eliminated fire growth potential in mid October.

PURPOSE

The purpose of this repair plan is to:

1. Summarize suppression activities that have occurred.
2. Identify and prioritize the needs for suppression repair.
3. Describe methods, estimated costs and timelines for repair activities.

An itemized list of repair needs by division is included as a table in this report and was made available to fire operations.

JURISDICTION

This repair plan pertains only to the Willamette National Forest lands. Any suppression repair activities that occur on adjacent private lands are the sole responsibility of the private land owner and/or Oregon Department of Forestry.

OBJECTIVES

The objective of this suppression repair plan is to mitigate adverse effects to resources resulting directly from fire suppression activities (FSM 2523.1). Surface water/erosion, resource protection, maintenance of site productivity, mitigation of impacts to scenery, and repair of damaged infrastructure are the focus of this work.

RESPONSIBILITIES

Development of the requirements for this suppression repair plan is the combined effort of the Incident Management Team (IMT), local fire staff, and the Forest Service Lead Resource Advisor. The IMT and local fire staff will be responsible for initiating the following repair activities. The Forest Service Resource Advisors will provide guidance in the field during repair, as well as monitoring, and document the quality of the repair efforts on National Forest lands. The Lead Read will be responsible for updating the repair plan and approving completed repair actions based on information gathered by operations and field READs.

Rehabilitation beyond the damage from fire suppression and associated activities, as identified during the combined efforts of the Resource Advisors and IMT, will be the responsibility of the Burned Area Emergency Restoration Team (BAER) and the Willamette National Forest and will not be addressed in this plan.

The IMT and the Willamette National Forest developed a transition plan to allow completion of repair and rehabilitation once the IMT was disbanded. An organizational structure was developed and staffed by district, forest, or regional personnel to accomplish repair and rehabilitation needs and to track accomplishments. Moving forward, the district will identify a Lead READ and a Lead Field READ who will provide overall coordination with the Forest, District and Fireline Resource Advisors for the remainder of the repair work. Specialists from the District or elsewhere will work directly with the Lead and Lead Field READ's to ensure that priority resource concerns are adequately addressed during as we complete repair work next field season.

RESOURCE INFORMATION AND RECORDS

The Lead READ worked with the Planning Section to develop site-specific repair recommendations and provided daily addendums to the plan, as needed. Specific information about roads, constructed fire lines, safety zones, drop points, water sources, and other suppression facilities was inventoried by the IMT. The IMT worked with the Lead READ to maintain a complete record (maps) and inventory of suppression actions and facilities during the fire. The preferred method of record keeping was ArcGIS online Collector. The IMT, additionally, maintained a complete record of suppression repair treatments and provide the information to the home unit prior to their demobilization.

The IMT provided the home unit with electronic copies of all GIS data developed for this fire, including fire perimeters, fire control lines (interior and exterior to the fire perimeter), drop point locations, safety zone locations, staging areas, water sources, structures, and helibases.

REPAIR GUIDELINES

The following Repair Guidelines address the specific on-the-ground actions that will be implemented on the Terwilliger Fire area. These guidelines were attached to the Incident Action Plans developed by the IMT. A spreadsheet detailing all required actions is attached along with a cost spreadsheet.

SUPPRESSION REPAIR

The following appendices relate to repair items and related specific actions unique to each division. Specific auxiliary information on each item can be found in the spreadsheet of Appendix A – Items Still Needing Repair. Additional repair Prescriptions B – Additional Repair Prescriptions. A cost analysis can be found in Appendix C – Suppression Repair Cost Summary. General repair prescriptions for each item can be found in Appendix D – General Suppression Repair Prescriptions, and a list of specific items that have already been repaired can be found in Appendix E – Completed Repair Work. Resource Summaries are in Appendix F – Resource Summary/Fire Suppression Best Practices. Repair Maps can be found in Appendix G

APPENDIX A – ITEMS STILL NEEDING REPAIR

Table 1. Estimated repair and equipment needs for roads used in the suppression of the Terwilliger Fire.

Road Used For Access or Line	ID	Name	Begin-Termini	End-Termini	Operation-Maintenance Level	Repair Comment	Equipment Needs
Y	1900000	AUFDERH EIDE DRIVE	Box Canyon	HWY 126	5 - HIGH DEGREE OF USER COMFORT	Blade, shape and roll aggregate section of Rd 19 through rock slide area, includes placement of 20 CY aggregate. Repair Asphalt Damage due to tree felling, rock debris and equipment use during suppression efforts between Road 1900415 and 1927. Asphalt surface damage from track machine operations and tree/rock fall will require skin/pothole patching (estimate 120 tons + 40 CY backfill aggregate). Remove and replace fire damaged guardrail between MP 50.16 (South of hot springs) to MP 54.4 (Road 1900415). Remove and dispose 1,590' and replace 843'. 700' of damaged guardrail will be replaced with earth berm 200 CY. Include 40hrs backhoe and dump truck time for debris removal (trees/rocks) through fire area	Set up S number Road Manager and project engineers to complete work; spot rock, grading, asphalt repair and guardrail repair via contract and task orders.
Y	1900403	SOUTH FORK LOG STATION	1900000	1900000	2 - HIGH CLEARANCE VEHICLES	Water fill site. Spot rock w/ 20CY, blade, shape and roll	Grader, roller, dump trucks
Y	1900415	RUSH CREEK	1900000	1900416	2 - HIGH CLEARANCE VEHICLES	Place cold patch asphalt in located hole	Hand labor
Y	1900416	HILL ROAD	1900415	Pvt Gate	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll, place drivable water bars	Excavator, grader, roller

Y	1900500	EAST SIDE COUGAR RESERVOIR	1900000	Slide Creek	3 - SUITABLE FOR PASSENGER CARS	Segment from Road 19 to Slide Creek CG place 50 CY aggregate at danger tree landing locations. Blading and rolling of segment will be completed under existing maintenance task order.	Grader, roller, dump Truck
Y	1900500 /1994		Slide Creek	Rd 1993	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll, pull suitable road edge berm material into road to establish crown	Grader, roller
Y	1927100	STARR CR.	1927000	1927140	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll	Garder, roller
Y	1927140		1927100	To end	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll	Garder
Y	1980282		1980000	To end	2 - HIGH CLEARANCE VEHICLES	Seed/mulch leveled area with recommend mix. Maintain for stockpile/disposal site. Use provided rehab seed	Hand labor/seed
Y	1980346		1980000	To end	2 - HIGH CLEARANCE VEHICLES	Seed/mulch helipad area with recommend mix. Use provided rehab seed.	Hand labor, seed
Y	1986000	RIDER CR.	1985000	FOREST BDR	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll to remove surface irregularities. Blade from MP 3.28 to Pvt Bdy. Place 100 CY aggregate at danger tree landing locations and for surface rock replacement	Grader, roller, dump trucks
Y	1986125		1986000	PVT ROAD	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll	Grader, roller
Y	1986132		1986000	Pvt Gate	2 - HIGH CLEARANCE VEHICLES	Blade, shape to Pvt gate	Grader
Y	1993551		1993000	Tie Road	2 - HIGH CLEARANCE VEHICLES	Blade, shape	Grader
Y	2618000	QUARTZ CREEK	Hwy 126, Finn Rock	1985	3 - SUITABLE FOR	Blade, shape and roll to remove surface irregularities. Segment from Road Hwy 126 to Wycoff place 500 CY spot rock for calculated surface rock replacement.	Grader, roller, dump trucks

				PASSENGER CARS	Place 150 CY Spot rock between Wycoff and Road 1985			
		STRUBE FLAT WASTE AREA			Level and shape disposal material hauled from Rd 19 and 1900500 roads			Excavator
Y	1986130		1986000	Gate location	2 - HIGH CLEARANCE VEHICLES	Replace/dispose damaged gate		
Y		ALL ROADS				Replace damaged road signs and route markers		

Table 2. Estimated repair costs for roads used in the suppression of the Terwilliger Fire.

ID	Segment-Length	Est. Unit Cost Grading	Total Grade Est.	Water Bar(Mi) Berm (Ea) Gate (Ea)	Guardrail Removal/Replace	Material Asphalt	Backhoe/ Dump Truck /Excavator by HR	Material Aggregate	Sign Damage Repair
1900000	13.20	\$900.00 per mile	\$ 180.00		\$38,865.00	\$ 25,310.00	\$ 6,600.00	\$ 2,000.00	
1900403	0.10	\$900.00 per mile	\$90.00					\$ 800.00	
1900415	0.10	\$0.00 per mile				\$ 100.00			
1900416	0.98	\$900.00 per mile	\$ 882.00	\$980.00					
1900500	1.40	\$0.00 per mile						\$ 2,000.00	
1900500/1994	5.90	\$900.00 per mile	\$ 5,310.00						
1927100	1.00	\$900.00 per mile	\$ 900.00						
1927140	1.20	\$600.00 per mile	\$ 720.00						

1980282	0.00	\$0.00 per mile							
1980346	0.00	\$0.00 per mile							
1986000	4.60	\$900.00 per mile	\$ 4,140.00					\$ 4,000.00	
1986125	0.40	\$900.00 per mile	\$360.00						
1986132	0.74	\$600.00 per mile	\$ 444.00						
1993551	0.78	\$600.00 per mile	\$ 468.00						
2618000	4.50	\$900.00 per mile	\$ 4,050.00					\$ 30,000.00	
Strube Flat							\$ 3,000.00		
1986130				\$ 3,000.00					
All Roads									\$ 1,000.00
PER ITEM TOTAL			\$ 17,544.00	\$ 3,980.00	\$ 38,865.00	\$ 25,410.00	\$ 9,600.00	\$ 38,800.00	\$ 1,000.00
ALL WORK ITEMS TOTAL			\$ 135,199.00						
MISC MOBILIZATION				\$ 17,575.87					
CONTRACT PREP/LABOR/ADMIN					\$ 6,759.95				
GRAND TOTAL ALL ITEMS						\$ 177,078.82			

Table 3. Fire Suppression Repair Features - Repair items for Division Delta and Alpha.

*Reference Unique ID for tracking.

UniqueID	Feature Category (Line Type)	Comments	Repair Status	Repair Comments	Shape Length
P054	Other	burned guard rail post	District Repair		
P085	Other	Dozer caused Asphalt FAILURE needs patch	District Repair	4FT x 4FT patch in asphalt. Dozer caused failure. Task order, Kenny Gabriel	
P133	Other		District Repair		
P147	Other	Property boundary markers damaged during dozer line construction.	District Repair	Relocate property boundary and reset markers - 9/22 RB	
P160	Other	Large diameter merch logs need to be cut to length then hauled out - 9/24 RB	District Repair	Large diameter merch logs need to be cut to length then hauled out - 9/24 RB	
P163	Other	Repair with excavator	District Repair	Excavator needed to repair burnout in road bed. Excavate and re-compact. - 9/25 RB	
P165	Other	Replace damaged sign post - burnt up.	District Repair	Replace damaged sign post - burnt up. Rough Road an 10 MPH sign in good condition	
P172	Other	Harvester damaged MP 5 carbonite	District Repair	MP 5 carbonite needs to be replaced - 9/28 RB	
P174	Other	Take to dump	District Repair	Haul tires and destroyed culvert to dump	
P179	Other		District Repair		
P185	Other		District Repair	Trees felled by dozer need to be removed from ditch	

P003	Unimproved Landing Area	Needs repair prescription	District Repair		
P006	Unimproved Landing Area	old rock pit, dozed open	District Repair	recontour, pull back dozed fill	
P055	Unimproved Landing Area	Landing that is used for log decks and processing. Also used for staging / drop point. 3-4 Mule train load of fire WOOD or pulp logs.	District Repair	Scarfify, slash and seed. Spread dirty slash between burn pile and timber stand for erosion control. Burn pile.	
P086	Unimproved Landing Area	Knock down berms and seed	District Repair	Knock down berms and seed	
P087	Unimproved Landing Area	Landing needs berms pulled back and seeded	District Repair	Landing needs berms pulled back and seeded	
P002		log landing, clearing	District Repair		

Table 4. Fire Suppression Repair Features - Repair items for Pappa.

*Reference Unique ID for tracking.

UniqueID	Feature Category (Line Type)	Comments	Repair Status	Repair Comments	Shape Length
L164	Access or Improved Road	Road improved with dozer, Culvert locations and waste sites marked 9/14 JH/RB. Tires placed at ends of bridge on 1994 for tracked shovel traverse. Logging ops commencing 9/16 RB	District Repair	Culverts/drains will need to be cleared/opened for proper drainage for logging ops. Remove logs from ditch line - 9/16 RB	13094
P072	Other		District Repair	French Pete Trailhead board and Wilderness boundary sign were removed and replaced with closure notice and flagging. Remove flagging and reinstall board and sign.	
P077	Other		District Repair	Lower East Fork Trailhead and Wilderness Boundary sign and parking lot signs were removed, need reinstall. Also, remove flagging.	
P078	Other		District Repair	Pull special treatment flagging along 411rd.	
P081	Other	Firewood and rotten slash from hazard tree mitigation	District Repair	Remove slash and rounds from roadway. Disperse evenly via chipping or transport.	

P084	Other		District Repair	Gather danger tree flagging on east fork trail	
P134	Other		District Repair	Pile and burn or chip slash, remove decked logs to identified location. Berm along road to deter future motorized use.	
P135	Other		District Repair	Pile and burn or chip slash, remove decked logs to identified location. Berm along road to deter future motorized use.	
P136	Other		District Repair	Pile and burn or chip slash, remove decked logs to identified location. Berm along road to deter future motorized use.	
P145	Other		District Repair	consult engineer	
P192	Other	Dispersed use site burned over and damaged. Barriers moved. Replace barriers. Seed burned area. Repair site.	District Repair		
P193	Other	Damaged guard rail. Repair.	District Repair		
L154	Other		District Repair	Collect closure signage posted along Wilderness Trails	51896

Table 5. Fire Suppression Point Features - Repair items for Division Zulu.

*Reference Unique ID for tracking.

UniqueID	Feature Category (Line Type)	Comments	Repair Status	Repair Comments	Shape Length
L051	Access or Improved Road		District Repair	Slash to chip at the beginning of the road; Ridge Stewardship unit on uphill side of road.	1122
L190	Completed Burnout	This is completed burnout off of French Pete Trail 3311	District Repair	Burnout resulted in wood and debris across trail and loss of tread. Money for 2 miles of tread repair, trail reconstruction, and debris removal should be allocated for work in the spring/summer 2019.	7977
L076	Management Action Point	Roadway in need of significant slash disposal. Some minor value for merchantable timber. Most value in firewood. Significant material down across river from both sides. Significant repair needed to repair aesthetic value.	District Repair	Chippers able to handle large diameter burnt slash needed. Place to stage firewood and or possible commercial firewood potential. Recommend Fire salvage evaluation to restore corridor safety	7545
L077	Management Action Point	Slash and hazard trees.	District Repair	Slash disposal and hazard tree mitigation needed.	708
P022	Other	Merch logs fallen for clearing	District Repair	Buck to merch length and deck logs for haul; Also, logs on 1980 348; POC Shadie Nimer	
P033	Other		District Repair	Pull berms back around trees. Flush stump saplings cut. lock gate	
P036	Other	French Pete Campground fire suppression work and site prep	District Repair		
P038	Other	Excavated spot for material on helispot	District Repair	Engineer can look at this. May use for chip spreading spot. Good location to pile firewood for public use.	

P091	Other	washout caused by water from engine putting out a near road smoking stump, likely needs some aggregate. washout is approx 2 ft wide, 3 ft deep and 30 ft long	District Repair		
P095	Other	likely need an excavator and aggregate material	District Repair		
P138	Other	Cracking and indentation on Southbound shoulder/fog line due to felled large diameter tree. Approximately 11' x 5' - 9/14 JH/RB. Kenny, do task order	District Repair	Skin patch for pavement	
P124	Other	Replace/repair damaged sharp turn sign/post just before MP 44	District Repair	Repair/replace	
P129	Other	Remove rocks/debris - new culvert	District Repair	New culvert installed in July/August, now blocked with small boulders/fallen debris. Catch basin and outlet need to be cleared. Likely need a small excavator or hand crew to clean	
P103	Other	clean out and chip or scatter	District Repair		
P116	Other	lots of wood and brush blocking a culvert outlet	District Repair		
P137	Other	Clear for adequate drainage	District Repair	Clear inlet of debris and use bottle jack with plate to jack open outlet from being smashed. Return to as close to as circular as possible	

P139	Other	Needs to be replaced	District Repair	Replace road marker/carbonite 1980208	
P146	Other	Replace sign post - signs ok - 9/22 RB	District Repair	Replace sign post	
P155	Other	9/23 emptied and flagged	District Repair	if trash present, haul out and replace bags. pull flagging	
P177	Other	Damaged asphalt	District Repair	Need engineer evaluation. Pavement damaged from trees falling and equipment chipping edge; Kenny add to task order	
P181	Other	Too much water used/inadequate rolling. Muddy	District Repair	Will need to re-blade/shape and roll segment from MP 8.5 to junction of 1985 once road has a chance to dry a bit. - 10/1 RB	
P175	Other	short hose lay, needs to be pulled; pick up hose at end of guardrail JBH10-10	District Repair		
P187	Other	Merchant logs	District Repair	8 merch logs need to be removed. Hard T.S. POC Shadie Nimer	
P188	Other	About 15 merch logs	District Repair	Remove about 14 merch logs; Hard T.S. POC Shadie Nimer	
P195	Other	2 portable toilets. Remove. Removed JBH, 10-10. STILL FIREWOOD ROUNDS TO BE PICKED UP	District Repair		
L078	Other	Significant tree Mortality along roadway. Hazardous situation for public. Recommend district personnel evaluate for salvage.	District Repair	Consult Timber specialist	1211

L010	Road as Completed Line	brushing	District Repair	Chip or scatter (avoid river and wetlands); Fire to pick up all merch and firewood pieces and deliver to Strube Flats	23147
P049	Value at Risk	Outhouse was wrapped	District Repair	Outhouse unwrapped 9/6, pick up equipment, clean up trees fallen in parking space, clean brush laying into roadway (minor), low stump road to trailhead. Several danger trees at outhouse need assessment	

APPENDIX B – ADDITIONAL REPAIR PRESCRIPTIONS

REQUIRED ACTIONS IN ALL FIRE AREAS –

- Remove all closure signs from wilderness and non-wilderness areas once wilderness is reopened. This will require overnight stays in the wilderness and can be completed by fire or recreation resources.

Item	Units (Days)	Number of Units	Cost/Unit	Total
Squad	6	1	\$1500	\$9,000

REPAIR OF TRAILS DAMAGED BY FIRE SUPPRESSION ACTIVITIES –

- Repair the East Fork and French Pete Trails where they were used as fireline.

Item	Units (Days)	Number of units	Cost/Unit	Total
Squad	10	1	\$1500	\$15,000

DANGER TREE REMOVAL AND ALL FIRE POINT AND LINE REPAIR

- Survey, revegetate and treat for invasive plant species spread by fire suppression activities. Treatment and revegetation is estimated for 211 acres. Survey is necessary for 531 Acres. Labor will be completed by crew under direction of detailer and READ's.

Item	Units (Acres)	Number of Units	Cost/Unit	Total
Weed Survey	531	1	\$100	\$53,100
Revegetation Materials	211	1	\$100	\$21,100
Weed Treatment	211	1	\$300	\$63,300

- De-compaction, Aesthetic Repair, Brush Disposal, Erosion Mitigation, Pile burning at landings. This work will also include work outlined in Table 3, 4 and 5.

Item	Units (Days)	Number of Units	Cost/Unit	Total
Detailer	80	1	\$300	\$24,000
READ	40	1	\$300	\$12,000
Crews	20	2	\$6,000	\$240,000
Chippers	20	2	\$1,200	\$48,000
Excavator	20	2	\$1,600	\$64,000
Mobilization for Excavator	8	2	\$1,000	\$16,000

- Repair damage to airstrip

Item	Units (Days or acres)	Number of Units	Cost/Unit	Total
Disk Plow	1	1	\$1,600	\$1,600
Mobilization	2	1	\$1,000	\$2,000
Roller	1	1	\$1,300	\$1,300
Revegetate	6	1	\$300	\$1,800
Weed Treatment	6	1	\$200	\$1,200

- Repair Strube Flats (Staging Area)

Item	Units (Days or acres)	Number of Units	Cost/Unit	Total
Excavator	2	1	\$1,600	\$3,200
Transport	1	1	\$1,000	\$1,000

- Repair 1980282 helicopter landing area

Item	Units (Days or acres)	Number of Units	Cost/Unit	Total
Excavator	1	1	\$1,600	\$1,600
Transport	1	1	\$1,000	\$1,000

- Repair Camp Whitebrach (Base Camp)

Item	Units (Days or acres)	Number of Units	Cost/Unit	Total
Excavator	1	1	\$1,600	\$1,600
Transport	1	1	\$1,000	\$1,000
Revegetate	5	1	\$300	\$1,800

EMERGENCY CONSULTATION FOR ENDANGERED SPECIES AND CULTURAL SURVEYS

- Emergency consultation with the United States Fish and Wildlife Service for affects to Endangered Species. Additionally, surveys are needed in areas where ground disturbance will occur as we de-compact skid roads used during suppression activates.

Item	Units (Days)	Number of Units	Cost/Unit	Total
Biologist	3	1	\$500	\$1500
Cultural Specialist	10	1	\$300	\$3,000
Cultural Specialist (Assistant)	10	1	\$265	\$2,650

APPENDIX C – SUPPRESSION REPAIR COST SUMMARY

Table 6. Suppression Repair Costs Summary

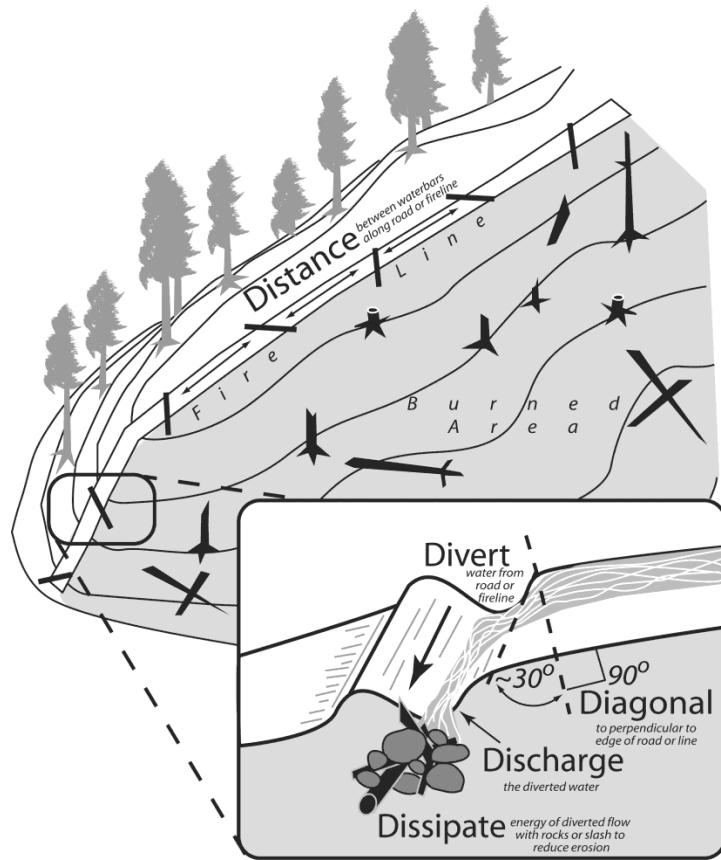
Action	Responsible Program	Item	Units (Days)	Number of Units	Cost/Unit	Total
All Area Repair	Recreation	Squad	6	1	1500	\$9,000
Trail Repair	Recreation	Squad	10	1	1500	\$15,000
Invasive Species Management	Botany	Weed Survey	531	1	100	\$53,100
		Revegetation	211	1	100	\$21,100
		Weed Treatment	211	1	300	\$63,300
Danger Tree Removal and Fireline Point and Line Repair	Fire	Detailer	80	1	300	\$24,000
		READ	40	1	300	\$12,000
		Crews	20	2	6000	\$24,000
		Chippers	20	2	1200	\$48,000
		Excavator	20	2	1600	\$64,000
		Transport for Excavator	8	2	1000	\$16,000
Airstrip Repair	Fire	Disk Plow	1	1	1600	\$1,600
		Transport	2	2	1000	\$2,000
		Roller	1	1	1300	\$1,300
		Revegetate	6	1	300	\$1,800
		Weed Treatment	6	1	200	\$1,200
Strube Flats Repair	Fire	Excavator	2	1	1600	\$3,200
		Transport	1	1	1000	\$1,000
1980282 Repair	Fire	Excavator	1	1	1600	\$1,600
		Transport	1	1	1000	\$1,000
Camp Whitebranch Repair	Fire	Excavator	1	1	1600	\$1,600
		Transport	1	1	1000	\$1,000
		Revegetate	6	1	300	\$1,800
Emergency Consultation and Cultural Surveys		Biologist	3	1	500	\$1,500
		Cultural Specialist	10	1	300	\$3,000
		Cultural Specialist (Assistant)	10	1	265	\$2,650
All Road Repair	Engineering	Roads	N/A	N/A	N/A	\$177,078.82
Grand Total						\$768,828.82

***Costs do not include IMT or other overhead expenditures or mobilization fees.

APPENDIX D – GENERAL SUPPRESSION REPAIR PRESCRIPTIONS

HANDLINES

- REAFS and FOBS should make sure to GPS interior and exterior firelines to ensure all fireline has been located.
- After the fire is out or when directed, obliterate all constructed firelines by pulling in the berm and scattering debris to at least 50% ground cover after subsoiling. If there isn't enough debris to achieve this, mulch with wood straw or weed-free straw. Work with a resource advisor to implement mulching.
- Block/Camouflage access points to hand lines to keep them from becoming future walking trails.
- Distribute concentrations of slash created during hand line rehabilitation. Utilize slash on disturbed soils in order to reduce erosion.
- Where rock outcrops, talus or scree slopes were used as natural barrier firelines, restore slope contour by raking slope material back into the fireline until flush.
- On Hand line that is heavily compacted where subsoiling has proved ineffective, place waterbars according to the following guidelines:
 - 1) Dig/Excavate in the waterbar – do not simply push up loose soil.
 - 2) Waterbars should direct runoff AWAY FROM the burned area where possible.
 - 3) Assure that the down slope end of the waterbar is open and has adequate length to allow free flow of water off the fire line.
 - 4) Logs can be incorporated into waterbars as long as they are embedded or anchored in a trench
 - 5) Place slash below outlets of waterbars in steep areas or areas that outlet flow may cause erosion. This will help slow runoff and help collect sediment.



Fire Line Slope %	Maximum Water Bar Spacing (feet)
2-5	300
6-10	200
11-15	150
16-20	100
21-35	75
36+	50

DOZER LINES

- REAF and FOB's should make sure that to GPS interior and exterior firelines to ensure all fireline has been located.
- In order to discourage use and potential resource damage by Off Highway Vehicle's (OHV's) construct earthen berms and/or place boulders, heavy logs, slash and other large vegetative material at the beginning of dozer lines that are on non-system roads or trails closed to motorized travel.
- Place boulders, heavy down wood and debris to effectively prohibit motorized access on dozer or hand lines that are not access points for roads or trails. Take extra care

to return the entry points to a natural appearance that blends in with the surrounding landscape to the extent possible.

- After the fire is out or when directed, obliterate all constructed firelines by pulling in the berm, subsoiling to a depth of 18-24" to cause full infiltration (excavator with a subsoiling excavator bucket is typically the best, most efficient tool for this work), and scattering debris to at least 50% ground cover after subsoiling. If there isn't enough debris to achieve this, mulch exposed soil with wood straw or weed-free straw. Work with a resource advisor to implement seeding where necessary. In some instances, berms will be smoothed out away from the line and debris will be scattered off of the line in order to preserve line function for future incidences. In these cases, the objective is to achieve hydrologic stability within the line while also making it unnecessary to have to reopen all of the line with heavy equipment.

Resource Advisors will help identify these areas.

- Where rock outcrops, talus or scree slopes were used as natural barrier firelines, restore slope contour by raking slope material back into the fireline until flush.
- Avoid using rehabilitated firelines as travel corridors to reduce soil compaction.
- On Dozer line that is heavily compacted and where the soil type dictates that subsoiling will be ineffective, place waterbars according to the same specifications outlined in the handline section. Excavators are typically the best tool for accomplishing this work in an efficient manner.

STUMPS

- In wilderness, or areas with specific prescriptions, utilize a plunge cut technique to encourage water retention and rot in order to make stumps appear natural. Do not cross hatch stumps.
 - All stumps along Forest Service Road 19 shall be flush cut.
 - Stumps in all other areas should be cut to 12 inches or lower.

ROAD REPAIR

- Clean brush and slash out of ditches on roads that were cleared and brushed.
- Dispose of brush by chipping, or hauling to disposal sites. Division REAF will identify disposal sites.

- Grade and shape all access and internal road systems that were used during fire operation, where appropriate. This includes the reshaping of water bars, drain dips, and ditch reconstruction.
- Identify the class of road used as fireline and work with a road specialist to return it to its previous condition.
- Work with READs to determine the need for additional drainage work.
- Road repair including drop points, spur roads and turnouts used for suppression activities will be addressed within the Repair spreadsheet and on the repair maps.
- Create barriers with boulders or heavy debris at entrances to roads that were closed prior to the fire to prevent motorized traffic.
- Damage to gates, culverts, drainage features (e.g. rolling dips, road cross ditching, and lead-off ditches) and signs from suppression operations will be repaired to the pre-fire condition.
- Damage to bridge running surfaces, bridge bumpers, object markers or damage from excessive loading per the READ load limit sheet will be repaired to pre-fire condition.
- Fall hazard trees that would reasonably hit main travel routes.

CHIPPING

- No chipping into streams or along riparian zones- Place chips onto opposite side of road if possible OR end haul to a location identified by REAF/DIVS
- -Provide a 30 foot buffer of no chipping at any water crossing or culvert.
- -Do not place chips into any road ditch
- -Do not chip onto steep up slopes. Instead, haul chips away to an appropriate location.
- -Ensure that chips are no more than 4" deep.

HELI-PADS

- Scatter and hide all trees, woody debris and brush cut during helispot construction.
- Cover and camouflage all bare soil created by construction of helispot with brush removed during construction.
- Apply repair methods identified in repair checklist to helicopter sling load sites, staging areas.
- Re-contour all areas within helispot to natural land contours.

GROUND SUPPORT / STAGING AT STRUBE FLATS

- Restore Strube Flats by cleaning up all garbage and grading the roads.
- Treat new, and expanded, areas of non-native invasive plants introduced by fire suppression activities.

TRAIL REPAIR

- If any trails were used as fireline, flush-cut or low-cut stumps at 45 degree angle facing away from the trail. Plunge cut twice into stumps to expedite rotting process. Do not hash cut stumps.
- Work with a technical specialist to install drainage features in trails as necessary to prevent erosion.
- Obliterate any short cuts between trail legs and any braided or parallel trail treads. If there are wide openings created for short cuts consider lateral mulching with cut brush and small trees.
- Obliterate any new non-system trails developed during fire suppression by restoring sidecast soil, installing drain dips to above standards, and dragging in cut brush or limbs.
- Scatter or drag away large piles of cut brush or trees from established system trails (up to 50 feet either side of trail). Blend in cut material with surrounding area.
- In areas where bucking occurred, attempt to distribute rounds in a manner that provides for an aesthetically pleasing appearance.

RECREATION

- Pump all toilets used by fire personnel on FS Road 19 corridor and other areas. Those include
- All trailhead and campground access roads should be graded and shaped as needed. The trailheads include but are not limited to
- All stumps adjacent to roads and rec sites shall be low-stumped and angle cut away from the road to disguise cut ends. All small diameter stumps should be flush cut.
- Obliterate any new user created trails or fire line unless otherwise specified. Block/Camouflage access points to hand lines to keep them from becoming future trails.
- Haul out any logs or trees that are down or felled and not identified to remain at the site to a designated public use area.

- Remove cut brush or chip and spread, not to exceed 4 inch chip depth and avoid clogging water drains and outlets.
- Unwrap structures and be sure to remove all staples or tape.
- Follow agency guidelines for defining hazard trees and fell only those trees necessary to maintain a safe environment.
- Have crews pick up all litter including micro trash, flagging, signs and other materials from the fire area.
- Replace all signs and infrastructure damaged by suppression activities.

SAFETY ZONES, DROP POINTS AND STAGING AREAS

- Pull berms back into area and re-contour.
- Scatter brush and debris back into area. Evaluate amount of material to be used prior to implementation so as not to create an additional fire hazard.
- Minimize compaction of soil by evaluating the need to rip area.
- Where available, place logs to discourage use by motorized vehicles.
- Where area was compacted, subsoil to a depth of 18” – 24” and scatter debris to at least 50% ground cover after subsoiling. If there isn’t enough debris to achieve this, mulch exposed soil with wood straw or weed-free straw. Work with a resource advisor to implement mulching to achieve 50% ground cover.
- Remove any dams or dikes constructed in water sources during suppression activities.
- Any terraces created for pump placement should be re-graded to the natural slope.
- Clean any fuel spills associated with pump operations. Coordination with REAF resources if a visible sheen is detected in any water sources following a spill.
- Contain absorbent pads in plastic garbage bags and dispose of properly (if contaminated, special disposal procedures are required).
- Replace any barriers that were removed to access water sources.
- Rehab and naturalize any user routes (foot/wheel) accessing water sources that are associated with suppression tactics.
- Pull all newly constructed crossings and temporary materials away from stream channels. Ensure there is no material left that can plug culverts.
- Remove all man made materials used to construct diversions or impoundments.
- Disturbed areas at stream crossings or pump chances may be treated with rock, mulch or erosion control matting depending on the site conditions and degree of disturbance.

- Block access to stream channels from roads, trails, and campgrounds; use slash and make it appear natural.
- Do not clear large woody debris from stream channels.
- Do not disturb stream bottoms and streambanks.

AREAS WITHIN ROBERT AUFDERHEIDE SCENIC BYWAY (FSR 19)

- Limb or fall trees only when they pose an eminent danger to people on the road or the road itself.
- If logs are not going to be removed, use directional falling so trees will lay in a natural (wind fall) appearing arrangement.
- Limit visibility of freshly cut stumps by cutting stumps angled away from the road or flush cut and rub soil.
- Avoid straight cuts on down logs by cutting logs at a 45-60 % angle.
- Do not throw rounds into creek.
- Minimize small cuts on logs when mopping up and roll sections back together so the log looks more natural.
- Remove all wood that impedes or threatens the integrity of the 19 road. This wood will be sorted into three categories: Aquatic Restoration Logs, Merchantable Timber, and Firewood.
- No logs should be removed from the river side of the 19 road unless they impede the maintenance of the road.

AREAS IN THE WILDERNESS

General Actions

- Remove all garbage (do not burn or bury), litter, and flagging from firelines, helispots, spike camps, etc.

Constructed Firelines

- Construct waterbars with the guidelines on page 14:
- Spacing should be somewhat irregular as to appear natural.
- May be constructed of logs or rock or combination of both.
- Angle should be 20-45 degrees to the orientation of the line. Waterbars should be placed in a way that drains water away from the fireline. Waterbars should “daylight”(The outlet should be clear of debris)

- After waterbars are constructed, pull berms in fire, smooth line to natural level of terrain and scatter duff, branches, and small logs in a natural arrangement.
- If cup trenches or deep fire lines exist, place logs lengthwise in trench and pull berms over them. This is to hide saw cuts and add organic matter to the soil.
- Logs should be natural in appearance (avoid using logs with cut ends)
- Minimum of 6" in diameter
- Can have branches attached (top side only)
- Should be 6 feet or longer (shorter logs should have rocks placed on downhill side).
- Runout ditches should be open and should direct water outside of fire line.
- Scatter concentrations of wood and bone yards to appear similar to surrounding area.
- Roll cut logs back into place to give a more natural appearance.
- Flush cut stumps within 4 inches of ground at same angle as the slope and cover with soil, woody debris, or make shallow bar tip cuts with saw or chop with a Pulaski, within site distance.
- If fireline intersects with system trail, follow guidelines under Trail Repair.

Stream Channels/ Water Chances or Lakes

- At lakes used for pumping or dipping, replace down woody material that was removed.
- Remove any dams or dikes constructed for suppression activities.
- Any terraces created for pump placement should be re-graded to the natural slope.
- Clean any fuel spills associated with pump operations. Utilize contracted fuel spill clean-up specialists in coordination with REAF resources.
- Contain absorbent pads in plastic garbage bags.

Spike Camps

- Remove all garbage (do not burn or bury), food scraps, and other trash
- Dismantle all fire rings created and place rocks to appear natural.
- Coals, burned logs, and ash should be cold and scattered to appear natural.
- Natural materials should be placed to restore camp area to a natural appearance (no evidence of tent pads).
- Fill and Rehab all slit trenches that were used for latrines.
- Police area for human waste not properly disposed of and bury at least 6 inches deep.

User Created and System Trails Modified by Suppression Efforts

- Scatter limbs, branches, and duff into user created trails from spike camps to give a natural appearance.
- Trails on steeper slopes should have debris placed to minimize erosion.
- Restore system trails as shown in illustration.
- Within site distance of a system trail, cover or disguise cut stumps, disguise or disperse shorter bucked log segments.
- Buck snags or designated hazard trees leaning across system trails as follows:
- Flush cut stumps and groove the top of the stump with tip of chainsaw bar. Place dirt into the cut and on the face of the log to encourage rot.

- Buck logs spanning the trail with an angle cut at a point 4 feet from centerline on both sides

Sling Sites, Medi-vac Sites, and Safety Zones

- Scatter limbs, branches, and duff into user created trails and openings at these sites to give a natural appearance.
- Within the disturbance zone of these created openings, disperse shorter bucked log segments, and apply the stump guidelines.

REVEGETATION GUIDELINES

In some instances there is a need to utilize native plants to revegetate areas that are very steep, highly erosive, susceptible to invasive plant species colonization, have higher aesthetic standards and require vegetation for screening avoidance areas. Most revegetation is accomplished through seeding and mulching of native grass species that the local district has on hand at the current time. In some specific areas there is a need to follow up grass seeding with tree, shrub and forb augmentation to ensure the ecosystem can recover in a reasonable amount of time. Blading with dozers can cause long term damage to soil biota so it is important to assist the recovery of highly sensitive areas. Resource Advisors and technical specialists will assist with identification of opportunities and areas to utilize seeding as an effective repair action. Seed is available at McKenzie River Ranger District.

SOIL STABILIZATION

Straw and wood chips will be used where necessary to help ensure soil stabilization, reducing erosion damage.

CULTURAL RESOURCES

Refer to list of cultural repair specifications provided by Resource Advisors to protect cultural site integrity.

APPENDIX E – COMPLETED REPAIR WORK

COMPLETED REPAIR WORK

The table below is a comprehensive list of items completed by the XXXX IMT and the Willamette XXXX IMT.

Table7. Road Repair Completed

Road Used For Access or Line	ID	Name	Begin-Termini	End-Termini	Oper- Maint LV	Repair Comment	Equipment Needs
Y	1900410	POWERHOUSE RD	1900000	SEC 31	5 - HIGH DEGREE OF USER COMFORT		
Y	1900411	COUGAR CR.	1900410	SEC 34	2 - HIGH CLEARANCE VEHICLES		
Y	1900420	FISHERMAN ACCESS	1900000	SEC 33	2 - HIGH CLEARANCE VEHICLES	Fell danger snags, chip slash and remove from drainage	Fallers, Hand Crew, chipper
Y	1900421	FRENCH PETE CAMPGROUND	1900000	1900000	4 - MODERATE DEGREE OF USER COMFORT	Fell danger snags, chip slash and remove from drainage along CG access road and day use parking	Fallers, Hand Crew, chipper

Y	1900439		1900410	SEC 30	2 - HIGH CLEARANCE VEHICLES	Spot rock to top of grade, 30 CY. Rehab (Seed) log landing area approx. 3 ac	Grader, Hand Crew
Y	1927000	AUGUSTA CREEK	Hiyu Pass	Road 19	2 - HIGH CLEARANCE VEHICLES	Chip slash and remove from drainage. Blade shape and roll to remove surface irregularities. Segment from Road 19 Hiyu Pass currently included on Maintenance TO	Chipper and Hand Crew
Y	1980000	HARDY CR.	1900000	2618000	2 - HIGH CLEARANCE VEHICLES	Chip slash and remove from drainage. Blade shape and roll to remove surface irregularities. Segment from Road 19 Hiyu Pass currently included on Maintenance TO	Chipper and Hand Crew
Y	1980000	HARDY CR.	1900000	2618000	3 - SUITABLE FOR PASSENGER CARS	Chip slash and remove from drainage. Blade shape and roll to remove surface irregularities. Segment from Road 19 Hiyu Pass currently included on Maintenance TO	Chipper and Hand Crew
	1980204	BLUE CR.	1980000	SEC 15	2 - HIGH CLEARANCE VEHICLES	Scatter slash and knock down berm from hand/scratch line constructed on roadbed	Hand Crew
	1980206	WHITE ROAD	1980504	SEC 9	2 - HIGH CLEARANCE VEHICLES	Scatter slash and knock down berm from hand/scratch line constructed on roadbed	Hand Crew
Y	1980208	PENNY CR.	1980000	1985000	2 - HIGH CLEARANCE VEHICLES	Chip slash and remove from drainage on both North and South side of Horn Creek	Chipper and Hand Crew
Y	1980209		1980208	SEC 32	1 - BASIC CUSTODIAL CARE (CLOSED)	Chip slash and remove from drainage. Install drivable water bars, entrance barrier not needed. MP 0.73 to MP 0.80 repair fill slope shoulder damage	Chipper and Hand Crew, excavator
Y	1980225	LOWER HARDY	1980000	SEC 20	2 - HIGH CLEARANCE VEHICLES	Re-establish drainage by removing soil and vegetation debris dams from ditch line and catch basins, haul debris to identified disposal areas, recommend masticating prior to entering with other equipment. Lower material pushed into existing slump areas prior to bridge and at upper overtopped culvert as directed. Place water bars beyond overtopped culvert	Masticator, excavator, front end loader

Y	1980230	HIDDEN LAKE	1980000	SEC 6	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll if grader and roller is ordered to fire	Grader, roller
Y	1980231		1980230	1985000	2 - HIGH CLEARANCE VEHICLES	Blade, shape and roll if grader and roller is ordered to fire	Grader, roller
Y	1980247	INDIAN RIDGE	1980000	SEC 19	2 - HIGH CLEARANCE VEHICLES	Blade shape and roll to remove surface irregularities. Segment from Road 1980 to Indian Ridge currently included on Maintenance TO	None
Y	1980289		1980291	SEC 4	1 - BASIC CUSTODIAL CARE (CLOSED)	Leave open for Timber Sale use	
Y	1980295		1980208	SEC 4	1 - BASIC CUSTODIAL CARE (CLOSED)	Install drivable water bars, entrance barrier not needed.	Excavator
Y	1980330		1980000	To End	1 - BASIC CUSTODIAL CARE (CLOSED)	Place drivable water bars, no barrier required	Excavator
Y	1980331		1980330	SEC 4	1 - BASIC CUSTODIAL CARE (CLOSED)	Place drivable water bars, no barrier required	Excavator
Y	1980348		1980000	SEC 9	1 - BASIC CUSTODIAL CARE (CLOSED)	Install drivable water bars, entrance barrier not needed.	Excavator
Y	1985000	GREEN MTN.	1900000	2618000	2 - HIGH CLEARANCE VEHICLES	Chip slash and remove from drainage, Blade, shape and roll if grader is ordered for fire, or complete with TS	Grader, roller, hand crew, chipper
Y	1985115	BOONE CR.	1985000	SEC 18	2 - HIGH CLEARANCE VEHICLES	Chip slash and remove from drainage, fell danger trees, clear trees from roadway to road failure past Boone Creek	Hand crew, chipper, fallers, excavator

Y	1985266		1985115	SEC 20	1 - BASIC CUSTODIAL CARE (CLOSED)	Chip slash and remove from drainage. Install drivable water bars, entrance barrier not needed. Fall danger trees	Excavator, hand crew, chipper
Y	1985276		1985115	SEC 19	1 - BASIC CUSTODIAL CARE (CLOSED)	Pull pit run rock material back into road/smooth out berms along road edges install drivable water bars. Barrier not required at entrance	Excavator
Y	1986120		1986000	SEC 19	1 - BASIC CUSTODIAL CARE (CLOSED)	Berm and water bar	
Y	1986124		1986000	SEC 18	1 - BASIC CUSTODIAL CARE (CLOSED)	Install non-drivable water bars, install entrance barrier	Excavator
Y	1986133		1986132	SEC 7	2 - HIGH CLEARANCE VEHICLES	Chip/Clear slash from drainage, Install drivable water bars. Remove logs from ditch line and scatter. Place berm and boulders at pvt dozer line.	Excavator, hand crew, chipper
Y	1993000	EAST FORK & WAPITI	1900000	2638 (HORSE CREEK)	2 - HIGH CLEARANCE VEHICLES		
Y	1993000	EAST FORK & WAPITI	1900000	2638 (HORSE CREEK)	5 - HIGH DEGREE OF USER COMFORT		
Y	2639000	KING RD	2638	1900-410			
	2639480	O'LEARY	RD 2639000	SEC 28	2 - HIGH CLEARANCE VEHICLES		
	2639484		2639480	SEC 29	2 - HIGH CLEARANCE VEHICLES		
Y	1993000	EAST FORK & WAPITI	1900000	2638 (HORSE CREEK)	2 - HIGH CLEARANCE VEHICLES		

Table 8. Alpha Delta Repair Work Completed

UniqueID	Feature Category (Line Type)	Comments	Repair Status	Repair Comments	Shape Length
Dozer Line					
L011	Completed Dozer Line	Rd 133, level 2 road to remain open(JH 9-7-18) 90% existing rocked road, southern portion (150') new dozed line. chip all slash along open road to downhill side. Lots of chipping work remains in ditch line	Completed - Inspected	Drivable waterbars (Completed 9/24) LongTerm-berm at flagged rd edge where dozed line to pvt begins pull in slash & compact slash on dozer line - No on Pvt.	2748
L014	Completed Dozer Line	short dozed line that ties into private, culvert damaged where it ties into the 1985 road	Completed - Inspected	machine waterbar and block. Complete 10/1 LM	261
L052	Completed Dozer Line	steeper dozed line, small to medium excavator	Completed - Inspected	crm inspected 9/22 top needs work. new point created	858
L068	Completed Dozer Line	Short dozer line. Small or medium sized excavator needed to rehab. Inspected 09/18/18 MW	Completed - Inspected	Pull back burns, seed, slash and waterbar.	381

L082	Completed Dozer Line	about 200 feet new dozed line then ties into 276 road.	Completed - Inspected	new dozed line could use small excavator. some steep portions need to evaluate. 276 road. waterbar. But not berm will be used in Boone timber sale. Complete 10/3 LM	3083
L084	Completed Dozer Line	Dozed line, upper half is existing road, road 120. lower half is new dozerline.	Completed - Inspected	Excavator needed, waterbar, and seed dozer line. [Water bar road (flagged in red), berm flagged in red and orange - 9/24 RB] - Water bars and berm completed, inspected - 9/28 RB	1435
L085	Completed Dozer Line	steep pre existing road bed opened by dozer.	Completed - Inspected	Install non-drivable water bars (flagged in red) and entrance barrier (flagged in red and orange). - 9/24 RB completed 9/30 LM	994
L087	Completed Dozer Line	Dozed line, steep in spots	Completed - Inspected	waterbar, slash, and seed. medium to small excavator but would need further evaluation complete 10/1 LM	1439
L089	Completed Dozer Line	Completed dozer line on preexisting road template.	Completed - Inspected	Pull slash and burm. Small or medium excavator needed.complete 10/1 LM	175
L118	Completed Dozer Line	Short piece of dozer line to ridge top. Hand line takes off half way up dozer line.	Completed - Inspected	Pull back burns, seed and slash. Small or medium sized excavator needed.	312
L159	Completed Dozer Line	not too deep. not too steep	Completed - Inspected	HEQ Group and READs scouted. Excavator operator determined they could take care of repairs after falling crew takes care of danger trees. - 9/27 RB complete 10/3 LM	969

L163	Completed Dozer Line	half of the way with blade down. other half just tracks	Completed - Inspected	Complete 10/1 LM	695
L177	Completed Dozer Line	Dozer line to 276 existing road	Completed - Inspected	Rehab dozer line from 1986 to 1985276, it's steep, excavator operator to inspect potential for water bars, need hand crew to buck logs out for work to be done. Has been snagged. complete 10/3 LM	550
L189	Completed Dozer Line	Small section of dozerline parallel to road	Completed - Inspected	Complete 10/1 LM	68
Completed Hand Line					
L012	Completed Hand Line	landline, first 500' fairly steep then flattens out	Completed - Inspected	hand waterbar, pull hose lay. 9/17 completed and inspected	1967
L013	Completed Hand Line	steep handline that ties into reservoir	Completed - Inspected	water bars unnessecary, recontour and pull slash over line where possible, low cut stumps that will be seen from reservoir, pull hose. Complete LM10/3	461
L171	Completed Hand Line		Completed - Inspected	waterbar where needed, pull in berms and slash. 9/17 completed and inspected	659
L086	Completed Hand Line	Direct handline ends prior to 1986 road - inspected 09/17/18 mw	Completed - Inspected	See general specs	935

L104	Completed Hand Line		Completed - Inspected	Hand line. Pull slash, water bar on steeper portions, pull berms. Approximately 500 feet on old road template and another 500 feet of 0% slope. 9/15 completed and inspected	2173
L119	Completed Hand Line	Mostly 70%-80% slope. Top half extremely rocky.	Completed - Inspected	On steep rocky portions, recontour slope and slash. On other steep portions, waterbar, pull back berms and slash. Inspected 09/17/18	4089
L155	Completed Hand Line	Hand line on rock ridge top - 09/16/18	Completed - Inspected	See general specs	215
L156	Completed Hand Line	Hand line on Rocky slope	Completed - Inspected	See general specs - inspected 09/16/18	184
L172	Completed Hand Line		Completed - Inspected	Inspected 09/18/18 MW	761
L170	Completed Hand Line		Completed - Inspected	waterbars not needed, pull berms and cover with slash. 9/17 completed and inspected	136
L169	Completed Hand Line		Completed - Inspected	cover with brush, no water bars necessary. 9/17 completed inspected	190
L175	Completed Hand Line		Completed - Inspected	9/19 completed and inspected by mackay	599
L173	Completed Hand Line	Inspected 09/18/18 MW	Completed - Inspected		240
L167	Completed Hand Line	p line flagged for access	Completed - Inspected	Complete 10/1 LM	403
L174	Completed Hand Line		Completed - Inspected	Inspected 09/19/18	289

Other Features					
P052	Other	Several trees fallen down hill in ditch.	Completed - Inspected	Remove logs from ditch. Need equipment. Complete LM 9/30	
P065	Other	cash of tires along road side	Completed - Inspected	Tires hauled to Strube flats	
P066	Other	fold a tank, pump, pump kit and hose cash	Completed - Inspected	remove equipment	
P089	Other	pushout in dozer line	Completed - Inspected	Excavator operator scouted area and acknowledged repair needed - 9/27 RB complete LM 10/3	
P128	Other	Destroyed culvert from fire - contract for replacement underway	Completed - Inspected	Contract for replacement of melted culvert and down spout in progress via Brandon Green - South Zone Engineer	
P140	Other	Tires for tracked equipment	Completed - Inspected	Dispose of tires - haul to Strube flats as well as the logs suitable for fire wood. - 9/26 RB	
P148	Other	Remove culvert, create ditch drain	Completed - Inspected	Remove destroyed relief culvert, create ditch in its place. Place berm blocking dozer line into private land. - Culvert removed - excavator need to touch up ditch - 9/28 RB complete 10/1 LM	

P144	Other	looks like it was pushed up during fire. log from fire	Completed - Inspected	Dozer pushout for parking area. Pull in material and remove large tree	
P149	Other	Clear catch basin in lieu of drivable water bar	Completed - Inspected	Clear catch basin in lieu of drivable water bar - marked with red flagging	
P150	Other	Clear catch basin in lieu of water bar - marked with red flagging	Completed - Inspected	Clear catch basin lieu of water bar - flagged in red	
P151	Other	Pull berm in and recompact push out area near shoulder - scatter vegetation - 9/23 RB	Completed - Inspected	Pull berm in and recompact push out area near shoulder - scatter vegetation - 9/23 RB	
P157	Other		Completed - Inspected	Tires hauled to Strube Flats - take to dump on Saturday	
P158	Other	Repair damage from harvester - 9/24 RB	Completed - Inspected	Use excavator to pull shoulder back and recompact damage from harvester. Marked by red flagging on each end with strip of pink length wise. Approximately 45 feet - 9/24 RB	
P159	Other	Repair ditch/shoulder damage from dozer line	Completed - Inspected	Use excavator to repair ditch/shoulder damage from dozer line. Flagged in red on each end, approximately 100 feet. Buck log for fire wood and haul out. - 9/24 RB	
P164	Other	Barrier to/from private land	Completed - Inspected	Plant boulders for barrier to/from private land 2019	
P167	Other		Completed - Inspected	Remove logs/rounds from ditch line	
P168	Other	Road damage from smoldering material	Completed - Inspected	Use excavator to excavate and re-compact. Will likely need to bring in suitable material from near by location. Complete 10/1LM	

P170	Other	Clear ditch of aggregate/dozer push out material	Completed - Inspected	Use excavator/grader to remove aggregate pushed into ditch line, flagged in red - 9/28 RB	
P171	Other	Clear ditch of aggregate/dozer push out material	Completed - Inspected	Use excavator/grader to remove aggregate pushed into ditch line, flagged in red - 9/28 RB	
P173	Other	Logs/rounds in ditch line	Completed - Inspected	Remove logs/rounds from ditch line. Various locations before and after this point - can use hand crew - 9/28 RB done LM 9/30	
P178	Other		Completed - Inspected	Culvert cleanout and shoulder repair. Complete 10/1 LM	
P186	Other	Short dozer line connecting pvt to rd 133	Completed - Inspected	Seed slash water bar tp pvt boundary only. Boulders blocking entrance already in place. Complete LM 10/1	
P048	Safety Zone	Timbered knob bulldozed flat to create safety zone.	Completed - Inspected	Soil spread out close to road edge. Maintain access to preexisting road template for future timber sale. Area re-shaped to drain, access to road is adequate - 9/26 RB	

P007	Unimproved Landing Area	created an opening for safety zone. leveled off small mound.	Completed - Inspected	slash, seed, and create drainage. Complete 10/1 LM	
L166	Other		Completed - Inspected	p line flagging to pull pulled 10/3 LM	154
P169	Other	Do not pass down logs until next spring, let area over winter to take care of danger trees due the severity of the burn and over all mortality. - Excavator operator will clear culvert inlet to allow adequate drainage just past this point.	Other - See Comments	Will need to clear road of down trees when winter passes.	
L088	Completed Dozer Line	short, steep dozed line	Completed - Inspected	hand waterbar, slash, seed, and pull back berms complete 10/1 LM	188
P189	Drop Point	Large dirt turn around	Completed - Inspected	Evaluate all pullout along 1986 and decide if preferable to keep or repair	
P169	Other	Do not pass down logs until next spring, let area over winter to take care of danger trees due the severity of the burn and over all mortality. - Excavator operator will clear culvert inlet to allow adequate drainage just past this point.	Other - See Comments	Will need to clear road of down trees when winter passes.	

Table 9. Repairs Completed For Division Papa

UniqueID	Feature Category (Line Type)	Comments	Repair Status	Repair Comments	Shape Length
Dozer Line					
L039	Completed Dozer Line	Short dozer line through treated timber sale unit.	Completed - Inspected	This is stored dozer line. Leave slash on the sides, install water bars where necessary, seed line with grass seed. Leave in condition where minimal work is needed to reopen in the future.	496
L131	Completed Dozer Line	Significant slash in berms.	Completed - Inspected	This is stored dozer line. Leave slash on the sides, install water bars where necessary, seed line with grass seed. Leave in condition where minimal work is needed to reopen in the future.	573
L141	Completed Dozer Line		Completed - Inspected	Basic repairs plus add tank traps up top by 1993 rd	678
Completed Hand Line					
L040	Completed Hand Line	Dirty hand line crosses 2 streams	Completed - Inspected	This is stored hand line. Leave slash on the sides, install water bars where necessary, seed line with grass seed. Leave in condition where minimal work is needed to reopen in the future.	2013
L130	Completed Hand Line	Handline from dp75 tied into dozer line. Through sale unit already harvested and extracted. May wish to leave as tactical fire line. 45-90% slope.	Completed - Inspected	This is stored hand line. Leave slash on the sides, install water bars where necessary, seed line with grass seed. Leave in condition where minimal work is needed to reopen in the future.	674
L142	Other		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	621

L143	Other		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	966
L144	Other		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	1517
L152	Other		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	1023
L153	Other		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	1843
L157	Other		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	622
Other Features					
P030	Drop Point	Landing created. Approx 150x75ft.	Completed - Inspected		
P027	Other		Completed - Inspected	Ask local timber dept. what they want done. 9/16/18 DM No repair needed	

P056	Other		Completed - Inspected	Felling operations snag dropped across trailhead. Needs bucked stack and slash chipped/disposed of	
P057	Other	Line around structure. Hose lay from rd and pump possible.	Completed - Inspected		
P058	Other	Cleared around bridge approximately 5 ft on either side. Minimal disturbance. Recommend no repair needed.	Completed - Inspected	Remove hoselay after use	
P059	Other	Bridge in good condition. Hand rail broken. Clean line on either side. Recommend no repair.	Completed - Inspected	If hoselay and sprinklers installed, remove and rip down flagging.	
P062	Other	Pump and sprinkler setups. 3 gas cans and trash from berms and absorbent pads. Remove all trash and equipment from site.	Completed - Inspected		
P070	Other		Completed - Inspected	Trailhead board, permit box, and Wilderness boundary sign were all taken down and need reinstalled. Saddle trail	

				sign needs new post near 1993 rd. and sign reinstalled	
P076	Other		Completed - Inspected	Pull hose, scatter debris, collect and remove trash. camo stumps, remove or scatter log rounds.	
P088	Other	Dozed push out on left side of the road	Completed - Inspected	pull berms seed potatoe patch	
P130	Other	Dozer improved landing/staging area.	Completed - Inspected	Likely need to bring material back into dozer affected area.	
P064	Pump		Completed - Inspected	Basic spot checks, keep petrol out of water	
P068	Unimproved Landing Area	Significant slash and soft soil. Approximately 50x100ft Landing/turn around.	Completed - Inspected	Mix of chipping and even dispersion. Rehab of soil and landing footprint.	
L145	Unknown		Completed - Inspected	P line: pull flagging, camo trail by road for 100ft, put cut rounds back in line with logs, scatter debris over trail	715
P028	Water Tank		Completed - Inspected	Remove tanksX2, all gear, and garbage	
P029	Water Tank		Completed - Inspected	Complete 10/3 LM	
P071	Pump		Completed - Inspected	Pull pump, hose, all gear and trash	

L038	Access or Improved Road	Road used for normal fire equipment travel	Other - See Comments	Remove logs/debris from ditch line/culvert catch basins. Will need excavator/grader to re-establish ditch line where danger trees where felled/pushed into by dozer. - 9/28 RB Blade/roll on Task order	21344
L135	Access or Improved Road	Primary access to contingency line.	Other - See Comments	Speak with ODF on turn back standards.	2673
L137	Access or Improved Road	Contact ODF on turn back standards.	Other - See Comments	No obvious impact observed	577
L133	Completed Dozer Line	Light blading by dozer on temp road. Significant impact where temp rd corners; dozer line punched approximately 500ft to handline. Temp road continues to King rd.	Other - See Comments	Private land turn back standards need to be discussed with ODF. Berms and slash present. 9/16/18 DM No repairs on private land as per AA.	4474
L134	Completed Hand Line	No impact to stream channel. Only 1-2 water bars needed.	Other - See Comments	Need to see if we are repairing private land. 9/16/18 DM No repairs on private land as per AA.	531
P069	Helispot	Brushing and general clearing activities. Speak with ODF on turn back standards.	Other - See Comments		
P060	Other	3 older footbridges. In state of decay. Hand line around both. Minimal disturbance. No repair recommended.	Other - See Comments	If hose lay and pump installed remove both. Remove flagging.	

P141	Other	Pavement collapsed, possibly due to heavy equipment.	Other - See Comments	Possible pavement collapsed due to heavy equipment/low boy using area as loading/unloading area. Will have District Engineer assess	
L136	Road as Completed Line	Significant slash in berms. High berms and soft road surface. Large cobbles and small boulders present as well. Possibly old temp road mixed with new dozer line cut.	Other - See Comments	Contact ODF on turn back standards. 9/16/18 DM No repairs on private land as per AA.	1534
P031	Water Tank		Repair Needed	Remove tanks, gear, and flagging. Seed nearby staging area after pulling in pushed woody debris and spreading over dug soil.	
P025	Other	Timber sale boundary, could be used as strategic fuel break	Unknown		

Table 10. Repairs Completed in Division Zulu

UniqueID	Feature Category (Line Type)	Comments	Repair Status	Repair Comments	Shape Length
Dozer Line					
L022	Completed Dozer Line	pushouts along dozerline	Completed - Inspected	Hand crew work on short cat line sufficient. JBH 10-3-18	190
Completed Hand Line					
L025	Completed Dozer Line	348 rd	Completed - Inspected	Water bars completed and inspected. Last thing is to get decked logs removed (approx 12) all cut to merch lengths - 9/20 RB	946
L043	Completed Dozer Line		Completed - Inspected	Hand crew work on short cat line sufficient. 10-3-18. JBH	175

L148	Completed Dozer Line	Dozed tracks to a pushed over snag	Completed - Inspected	water bars and pull slash; inspected 9/24-JD	473
L183	Completed Dozer Line		Completed - Inspected	Water bar, pull in slash.	224
L005	Completed Hand Line		Completed - Inspected		70
L006	Completed Hand Line		Completed - Inspected		336
L007	Completed Hand Line		Completed - Inspected		69
L008	Completed Hand Line		Completed - Inspected		58
L009					
L016	Completed Hand Line		Completed - Inspected	Inspected 10/7 NG	343
L017	Completed Hand Line		Completed - Inspected	Inspected 10/7 NG	877

L024	Completed Hand Line	Standard hand line repair - see plan	Completed - Inspected		2366
L026	Completed Hand Line		Completed - Inspected		143
L027	Completed Hand Line		Completed - Inspected		54
L028	Completed Hand Line		Completed - Inspected		166
L030	Completed Hand Line	Satellite reception was kinda of poor due to smoke I think. Hand line locations off a little. All lines connected together	Completed - Inspected		681
L031	Completed Hand Line		Completed - Inspected		162
L050	Completed Hand Line		Completed - Inspected		2161
L053	Completed Hand Line		Completed - Inspected		1407

L075	Completed Hand Line	Line goes to rivers edge. 10/3 hand line rehab is completed NG	Completed - Inspected	Hand line construction pulling back berms (possibly) and some water bars needed. Handline appears to be a trail to river. Hose lays and sprinklers will need removal. Spread slash evenly.	198
L090	Completed Hand Line		Completed - Inspected	Steep, inspected 10/3-JD	842
L095	Completed Hand Line		Completed - Inspected	Hand line on North side water barred and slash pulled to cover, line on South side slash pulled to cover - 9/28 RB completed and inspected	281
L105	Completed Hand Line		Completed - Inspected	Repair handline that goes to river. Some upper parts burnt over will not need repair since the fire burned out the handline. - completed and inspected by Div Zulu	298
L107	Completed Hand Line		Completed - Inspected	Inspected 10/2 Peterman and Hogervorst	644
L108	Completed Hand Line	Inspected 10/2 Peterman and Hogervorst	Completed - Inspected		109
L120	Completed Hand Line		Completed - Inspected	Inspected 10/2 Peterman and Hogervorst	800
L121	Completed Hand Line		Completed - Inspected	Inspected 10/2, Peterman and Hogervorst	834

L122	Completed Hand Line		Completed - Inspected		58
L147	Completed Hand Line	short hand line around roadside stopover in Sunnyside campground	Completed - Inspected		36
L162	Completed Hand Line	pull berm, waterbar	Completed - Inspected	rehab inspected 10/3 NG	1703
L191	Completed Hand Line	10/3 hand line rehab completed	Completed - Inspected		258
Other Features					
P004	Helispot		Completed - Inspected	Helipad has been completed. Work left: removed decked logs, and treat area for invasive species (scotch broom) - 9/19 RB	
P005	Helispot		Completed - Inspected	This location turned into a firewood storage location. Moved firewood to Strube Flats 10-8-18. JBH	
P143	Hot Spot	Road bed collapsing due to organic material burning/smoldering underneath.	Completed - Inspected	Holes in 1980 road have been repaired and inspected - 9/20 RB	

		Approximately 12' by 10' and 3-4 feet deep. Possibly deeper. Not impacting travel way currently, and visibly flaggedblocked to prevent accident. Plenty of travel way			
P013	Other	20'x60'	Completed - Inspected	Repair completed and inspected - 9/26 RB	
P020	Other	Small push outs with dozer at end of road	Completed - Inspected	Repair completed - 9/25 RB	
P023	Other	Short handline from 19 to river. Entered as a point in collector	Completed - Inspected		
P037	Other	Push out along road	Completed - Inspected	Repair completed and inspected - 9/26 RB	
P039					
P080	Other	20x60 pushout	Completed - Inspected		
P083					
P092	Other	need to remove, likely need an excavator or 3-4 people	Completed - Inspected		
P162	Other	need to be removed (removed 9/28)	Completed - Inspected		
P125	Other	Clear intermittent stream channel and culvert inlet of masticator debris cleared 9/25, wp	Completed - Inspected	Clear intermittent stream channel and culvert inlet of masticator debris	

P126	Other	Remove mastication debris and rounds from intermittent stream channel/culvert inlet	Completed - Inspected	Remove mastication debris and rounds from intermittent stream channel/culvert inlet	
P127	Other	Remove slash/rounds/logs from ditch line	Completed - Inspected	Remove slash/rounds/logs from ditch line	
P142	Other	Bad spill location - created temporary dam to block spread. Needs attention asap. Cleaned up 10-4-18; Marsh and Grant	Completed - Inspected		
P152	Other	9/23 emptied garbage can and left flagging	Completed - Inspected	check for trash. if trash present, pack out and put in new bag. pull flagging.	
P153	Other	9/23 emptied and flagged; all garbage picked up. JBH. 10-10	Completed - Inspected	if trash present, haul out and replace bag. pull flagging	
P154					
P156	Other	9/23 emptied and flagged	Completed - Inspected	if trash present, haul out and replace bags. pull flagging	
P176	Other	chip or scatter the brush, remove the firewood	Completed - Inspected		

L018	Other	access to handline	Completed - Inspected	Inspected 10/7 NG	1127
L176	Other	Hydraulic fluid leak - approximate length of affected area is approximately 0.881 miles. Beginning flagged in pink	Completed - Inspected	Excavator leaking hydraulic fluid, spotty. Hydrologist, soil scientist READs have been to site. HAZMAT needed. First Strike cleaned hazmat site 10/4 Grant & Marsh	4755
L177	Other	Shoulder damage from dozer	Completed - Inspected	Repair completed and inspected - 9/26 RB	449
P008	Pump	2 pumps	Completed - Inspected	no pump found 10/7 NG	
P014	Pump		Completed - Inspected	pumps removed 9/8/18	
P018	Pump	Honda Trash Pump RMK-1222-16	Completed - Inspected	Pump and equipment pulled and gone. JD-9/26.	
P032	Pump	1 Mark 3 Pump -	Completed - Inspected	Installed fish screen. Get back to district. Inspected 9/24-JD	
P040	Pump	1 Honda Pump and one Mark 3 pump	Completed - Inspected		

P050	Pump	Honda Trash NWK-1222-69. Has large fish screen	Completed - Inspected	Pull equipment when done. equipment removed 10/7 NG	
P053	Pump	odf engine pump site, large fish screen	Completed - Inspected	make sure everything collected. Inspected 10/7 NG	
P063	Pump	Mark 3 with large fish screen. Number 020221	Completed - Inspected		
P190	Pump	trash pump, hose, gas, etc. on side of road.	Completed - Inspected	needs to be picked up. picked up 10/6 NG	
P012	Water Source		Completed - Inspected		
P009	Water Tank		Completed - Inspected	Inspected 9/24-JD	
P015	Water Tank		Completed - Inspected	tanks and pumps removed 9/8/18	
P161		Subsoiled/slashed	Completed - Inspected		

APPENDIX F – RESOURCE SUMMARY / FIRE SUPPRESSION BEST PRACTICES

The Terwilliger Fire and suppression activities put resources at risk. The following areas of concern and mitigation measures were identified:

Aquatics/Fisheries – Kate Meyer

- Critical Habitat for Bull Trout and Salmon species in several key watersheds. Class 1 streams with ESA threatened anadromous fish are located within the fire suppression perimeter in the South Fork McKenzie River, mainstem McKenzie River, Horse Creek, and numerous tributaries to these main channels. Use screen pumps (max opening 3/32nds with no greater than 0.33 ft/sec velocity 3" from the screen face) to limit sucking up, or trauma to, juvenile fish. Avoid drafting out of the Roaring River.
- No more than 10% of instantaneous surface flow should be removed from any stream providing habitat to ESA listed species. No more than 50% of the instantaneous surface flow should be removed from tributaries of ESA listed streams.
- Spring chinook salmon are currently moving to spawning grounds and may be present and/or spawning in streams where suppression activities are occurring. Minimize activities that may disrupt spawning activities or result in injury to spring Chinook or their redds. Some examples of disturbing/harmful activities include: blasting to remove hazard trees, heavy equipment crossing streams, tree felling into streams, fuel spills, pump intakes, etc...
- Minimize dozer line near streams to reduce the potential of sediment entering the stream network. Utilize hand lines whenever possible when working through riparian areas.
- Utilize pre-approved dip sites for helicopter bucket work when feasible. Resource advisors can reference the “dip YES” maps for approved waterbodies and can identify sites with known resource concerns.
- Utilize the “retardant YES” maps for pre-approved retardant drop locations. No retardant shall be dropped within the avoidance zones unless there is a threat to life.

Water quality – Nick Grant

- McKenzie River is the drinking water source for the city of Eugene. If possible, limit the construction of dozer line within 180 feet of tributaries draining toward the McKenzie River.

Cultural Resources – Cara Kelly

- Cultural sites are in the fire suppression perimeter. Cultural specialists should be employed during the incident to help identify avoidance areas and complete site monitoring.
- Work with a cultural specialists to protect cultural resources during mop up. The preference is to use IR and patrols rather than mopping up fire areas that contain known cultural resources. Known sites in areas to be mopped up should be flagged by a cultural specialist and avoided.
- Multiple historic lookouts, outbuildings, and shelters exist in the fire area. Key lookouts and shelters in the area include the Indian Ridge Look out and the Olallie Mountain look out. Please protect these structures with brush reduction and structure wrap if it is safe to do so.

Timber Resources and Sale Area- James Rudisill

A timber READ should coordinate with the Road Engineers and Forest Management for existing staging areas or existing helicopter landings. Use of existing landings or openings for staging areas is preferred over creating new landings. Forest Management will have maps of current timber sales and future management planning areas to protect values at risk.

Merchantable Logs:

- Log lengths (please maximize the length of log whenever possible):
 - 41 feet – Most preferred length
 - 37 feet
 - 27 feet
 - 18 feet – Least preferred length
- Minimum diameter is 7 inches.
- Process to a 6 inch top.
- Process unburnt trees on the unburnt side of the fireline.
- Process burnt trees on the burnt side of the fireline.

Fish Logs:

- Highly defective logs, logs with significant amounts of char and all hardwoods will be sorted for fish logs or firewood.
- Process to 50 foot log lengths whenever possible. Minimum length of 40 feet.

- No top diameter limit.
- Minimum diameter is 20 inches.

Log Decks:

- Deck unburnt trees on the unburnt side of the fireline.
- Deck burnt trees on the burnt side of the fireline.
- Deck fish logs separately.
- Deck Firewood separately.
- Keep processed slash out of decks and off roads.
- Minimize decking area as much as practicable. Utilize existing openings if possible. Decking logs in ditch lines is acceptable.
- Deck as many logs as practicable in one deck without blocking the road.
- Keep in mind that a self-loading log truck will be loading and hauling the logs so place logs within reach of road ways.

Wildlife – Penny Harris/Ruby Seitz

- Threatened Northern Spotted Owl sites are in the vicinity.
- Peregrine falcon nest sites are in the vicinity.
- Limit helicopter flights over, potential noise and physical disturbances to nest sites.
- If possible, avoid nest sites during line construction. Additionally, if sites are on the fire side of a burn out, try to apply firing operations, where effective, that utilize ground fire through the nest sites.
- Oregon Spotted Frogs are found in the high elevation lakes. Please use the dip yes map and avoid dipping in Oregon Spotted Frog habitat.

Invasive Species – Krista Ferris/Jenny Lippett

- Utilize weed wash station at ICP and Spike Camp to limit transfer of non-native invasive species from other areas to McKenzie River RD or from MRRD to other parts of the country. All new resources must wash at check in and all demobed resources must wash at check-out
- Helicopter buckets are washed with a hot wash before and after they change fires and any time the buckets are used in a new lake. Avoid dipping in two lakes with the same bucket until it is washed.
- If possible, avoid locating staging areas, drop points, constructed safety zones and Helispots in areas infested with noxious weeds.

Recreation – Jonathan Erickson

- If possible, maintain the visual character of Aufderheide Scenic Byway (Forest Service Road 19) through the Terwilliger fire area.
- Protect trails within the fire perimeter. Though it is desirable to avoid using trails as fire lines, this often needs to be balanced with the resource impacts of creating parallel fire lines. If trails are to be used for fire line, it is best if they can be brushed to the clearing limits associated with the trails. Typical clearing limits for trails are removing brush through the trail corridor at a width of 96" (8') and a height of 10'. If work is done outside of these parameters or crews will need to do any digging, involve a line qualified trail specialists during fireline construction. Trails are identified on the McKenzie River Ranger District Map. The trail event layer is identified on the IAP map.
- Maintain public safety by keeping people out of the closure area.
- Maintain Wilderness Character by allowing fire in wilderness to burn naturally and utilizing firelines outside of wilderness where possible.
- Communicate with the MRRD special uses program manager to alert any special use permit holders of fire spread that may affect their operations.
- Communicate with the Developed Recreation program manager of any changes in fire spread that may affect concessionaire run developed recreation sites or Forest Service operated concessionaire operated sites.

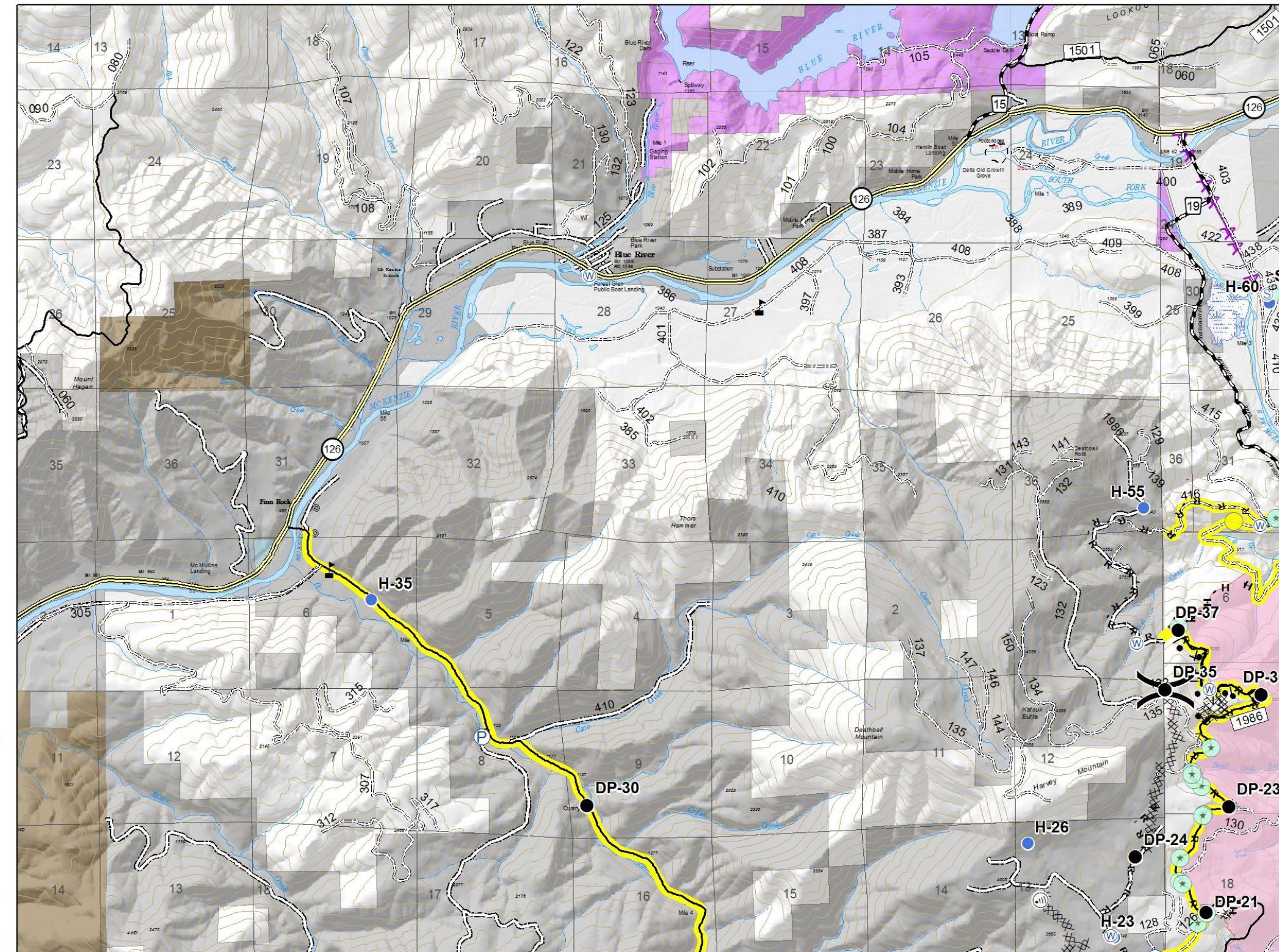
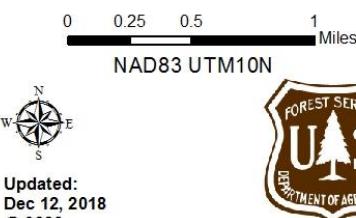
APPENDIX G – REPAIR MAPS

Terwilliger OR-WIF-180227 Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivA/D
Map: 1

- District Repair
 - In Progress
 - District Repair
 - In Progress
 - Drop Point
 - Helispot
 - Internet Access
 - Pump
 - Staging Area
 - Water Source
 - Value at Risk
 - Division Break
- xxxxx Completed Dozer Line
 H - H Completed Hand Line
 R - R Road as Completed Line
 I • I Completed Burnout
 — Arterial Road
 — Collector Road
 - - - Local Road
 - - - Trail_Willamette
 ■ Oregon Department of State Lands
 ■ Private Industrial Ownership
 ■ Private Ownership
 ■ US Army Corps of Engineers
 ■ US Forest Service



Terwilliger

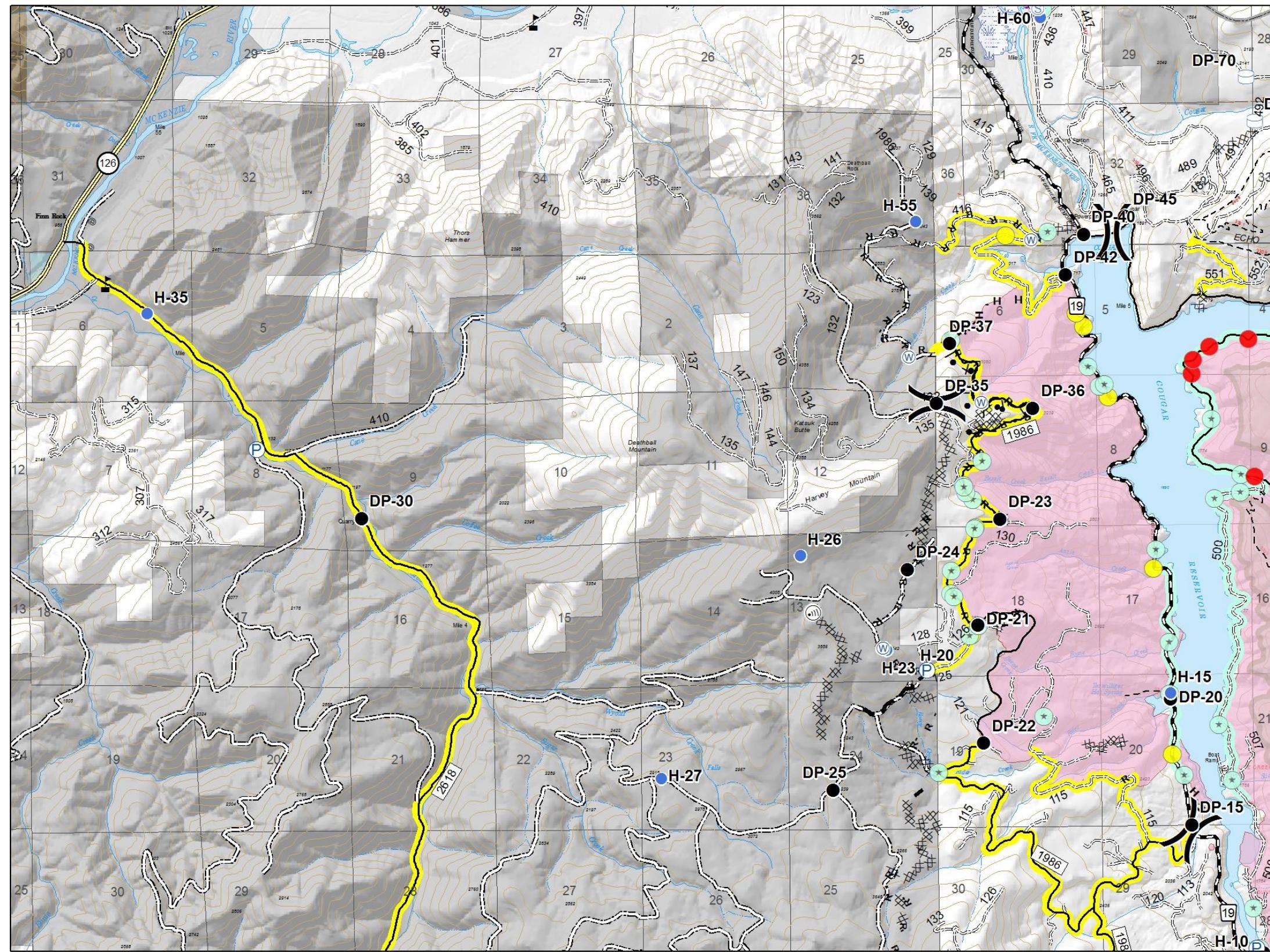
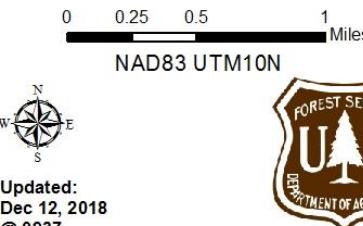
OR-WIF-180227

Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivA/D Map: 2

- District Repair
 - In Progress
 - Repair Needed
 - District Repair
 - In Progress
 - Drop Point
 - Helipost
 - Internet Access
 - Pump
 - Staging Area
 - Water Source
 - Water Tank
 - Value at Risk
 - Division Break
- xxxx Completed Dozer Line
 H - H Completed Hand Line
 R - R Road as Completed Line
 I • I Completed Burnout
 — Planned Fire Line
 — Arterial Road
 — Collector Road
 - - - Local Road
 - - Trail_Willamette
 ■ Wilderness
 ■ Oregon Department of State Lands
 ■ Private Industrial Ownership
 ■ Private Ownership
 ■ US Forest Service



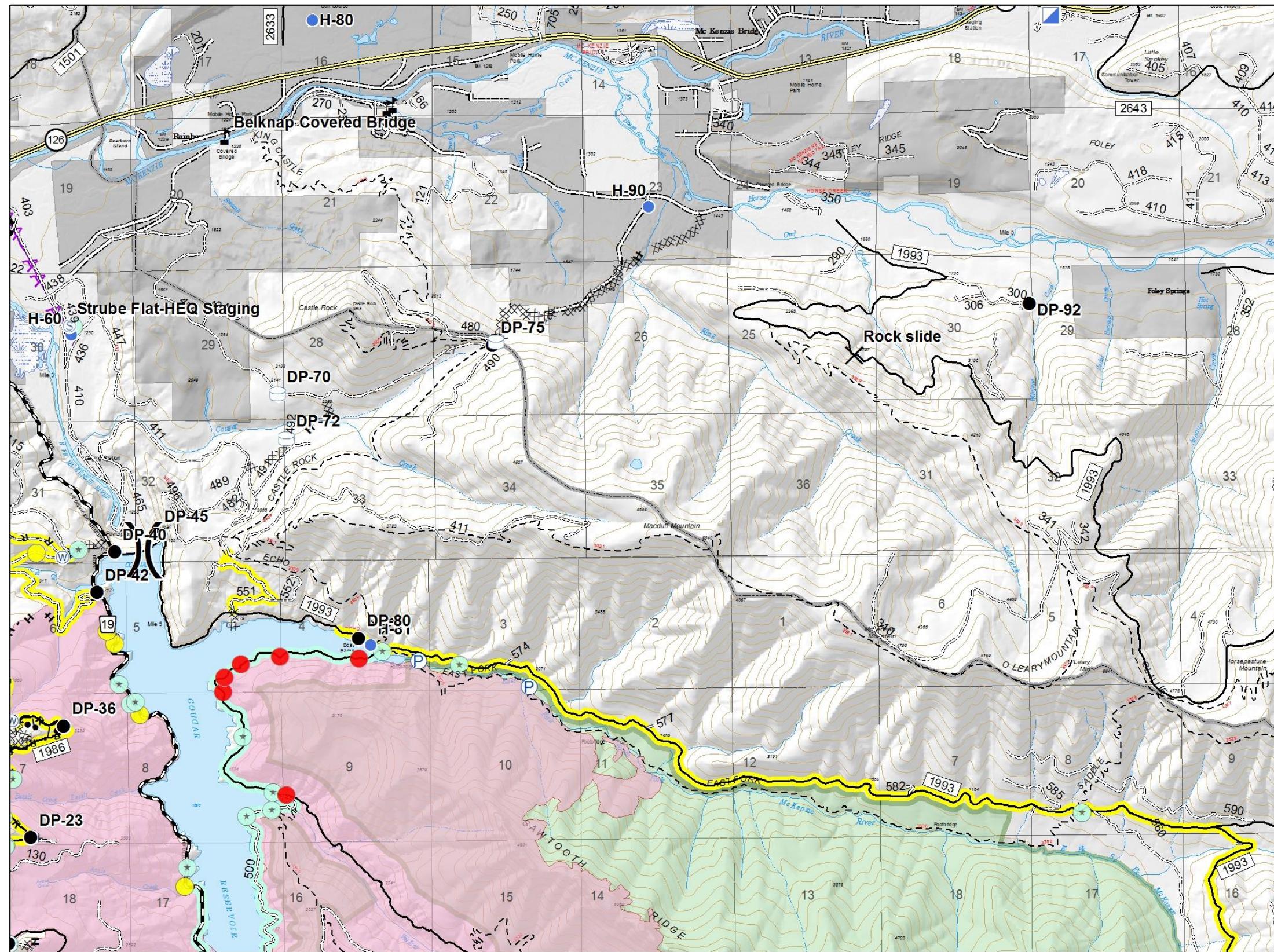
Terwilliger

OR-WIF-180227 Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivP
Map: 3

- District Repair
 - In Progress
 - Repair Needed
 - District Repair
 - In Progress
 - ✗ Closure
 - Drop Point
 - Helispot
 - Incident Command Post
 - Pump
 - Staging Area
 - Water Source
 - Water Tank
 - Value at Risk
 - () Division Break
- ~~~~~ Completed Dozer Line
 H - H Completed Hand Line
 R - R Road as Completed Line
 | | Completed Burnout
 — Arterial Road
 — Collector Road
 - - - Local Road
 - - Trail_Willamette
 ■ Wilderness
 ■ Private Ownership
 ■ US Forest Service
- 0 0.25 0.5 1 Miles
- NAD83 UTM10N
-
- Updated:
Dec 12, 2018
@ 0943



Terwilliger

OR-WIF-180227

Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivP
Map: 4

- (*) District Repair
- (*) In Progress
- (*) Repair Needed
- (---) District Repair
- (---) In Progress
- (●) Dip Site
- (●) Drop Point
- (●) Heliport
- (P) Pump
- (W) Water Source
- (W) Water Tank
- (X) Division Break

xxxx Completed Dozer Line

H - H Completed Hand Line

R - R Road as Completed Line

I - I Completed Burnout

— Arterial Road

— Collector Road

— Local Road

- - Trail_Willamette

■ Wilderness

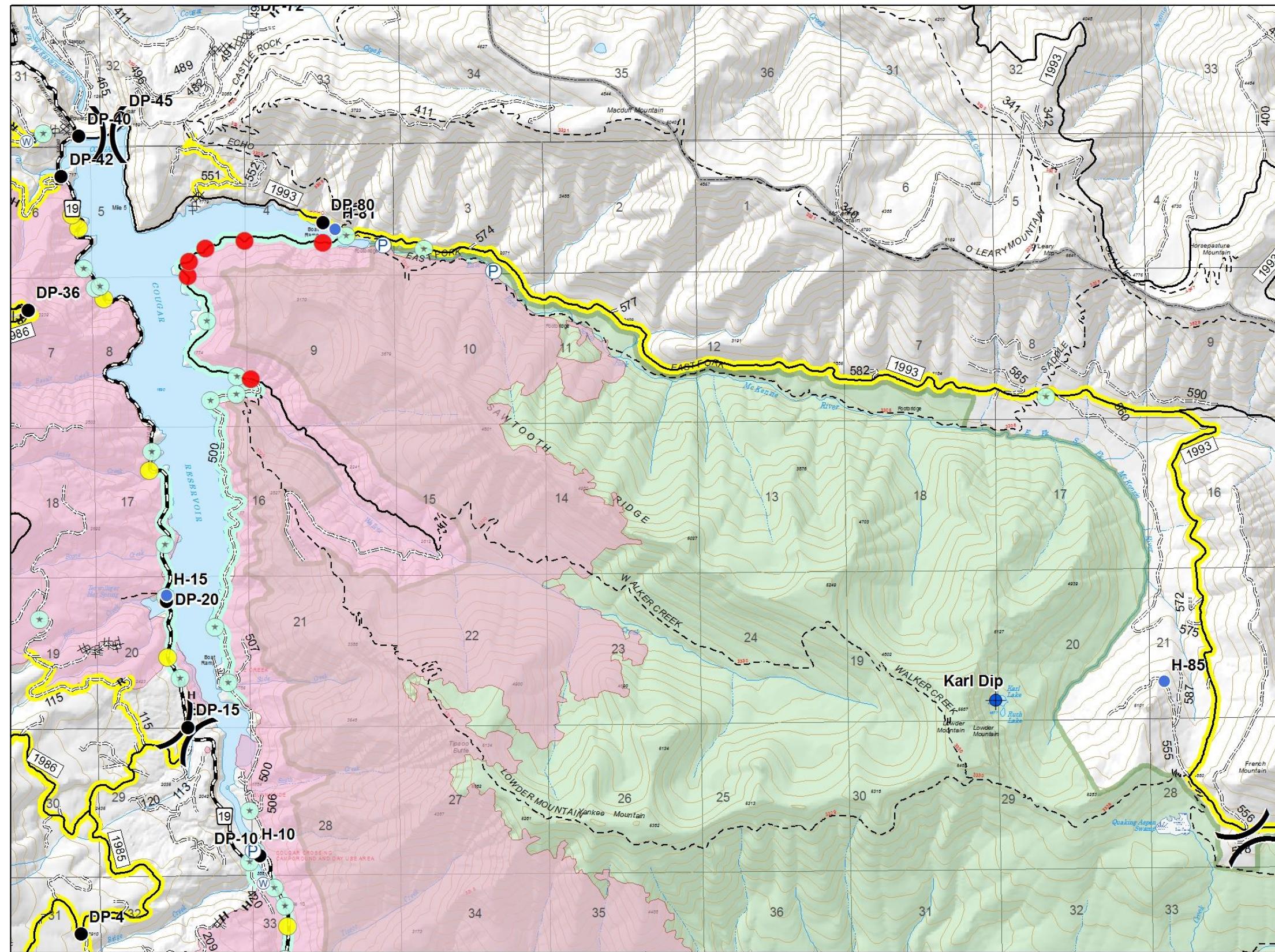
■ Private Ownership

■ US Forest Service

0 0.25 0.5 1 Miles
NAD83 UTM10N



Updated:
Dec 12, 2018
@ 0953



Terwilliger

OR-WIF-180227

Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivP
Map: 5

* District Repair
In Progress

District Repair

In Progress

Dip Site

Drop Point

Helispot

Pump

Water Source

Value at Risk

Division Break

xxxx Completed Dozer Line

H - H Completed Hand Line

R - R Road as Completed Line

Arterial Road

Collector Road

Local Road

Trail_Willamette

Wilderness

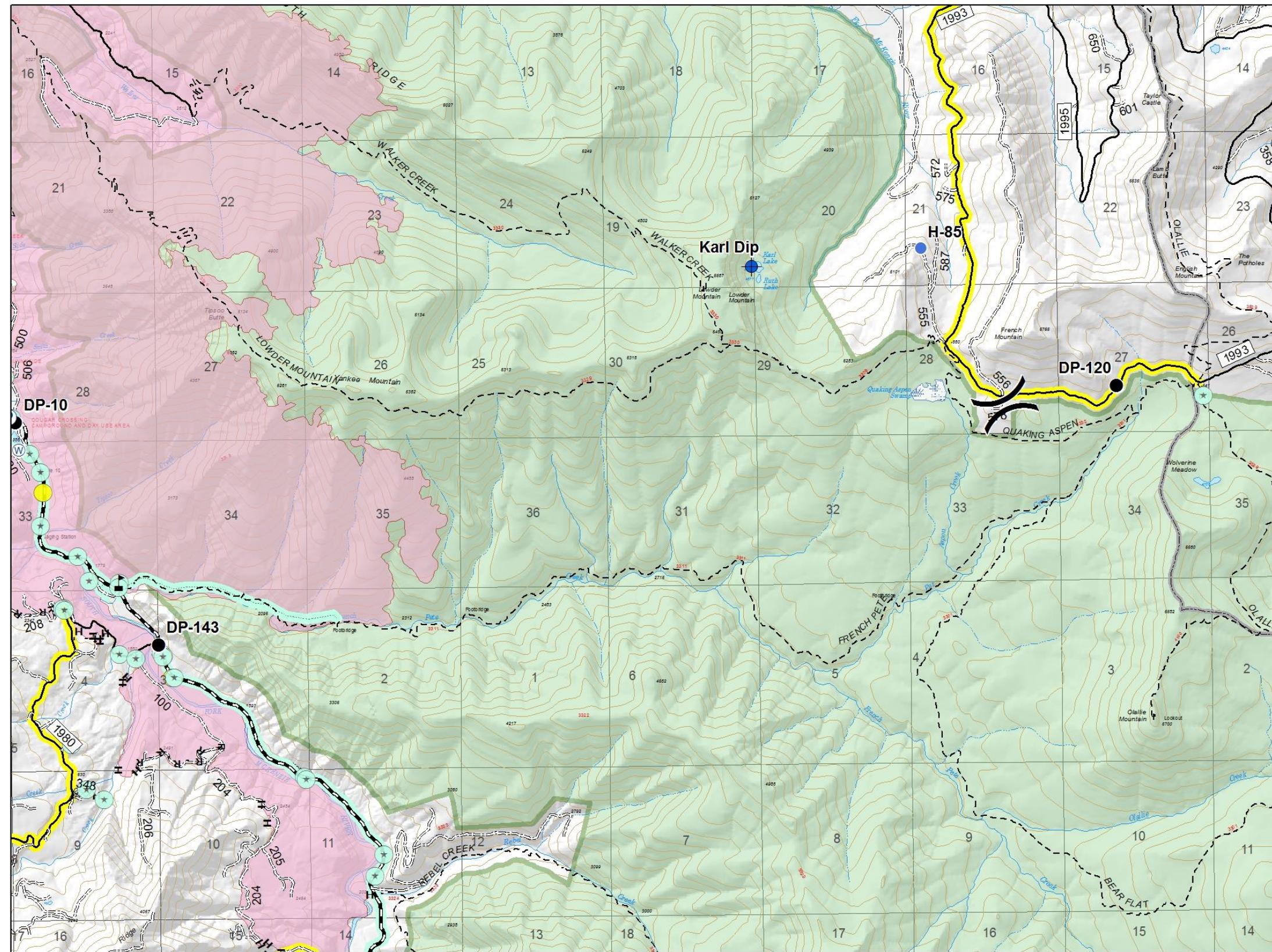
US Forest Service

0 0.25 0.5 1 Miles

NAD83 UTM10N



Updated:
Dec 12, 2018
@ 0954



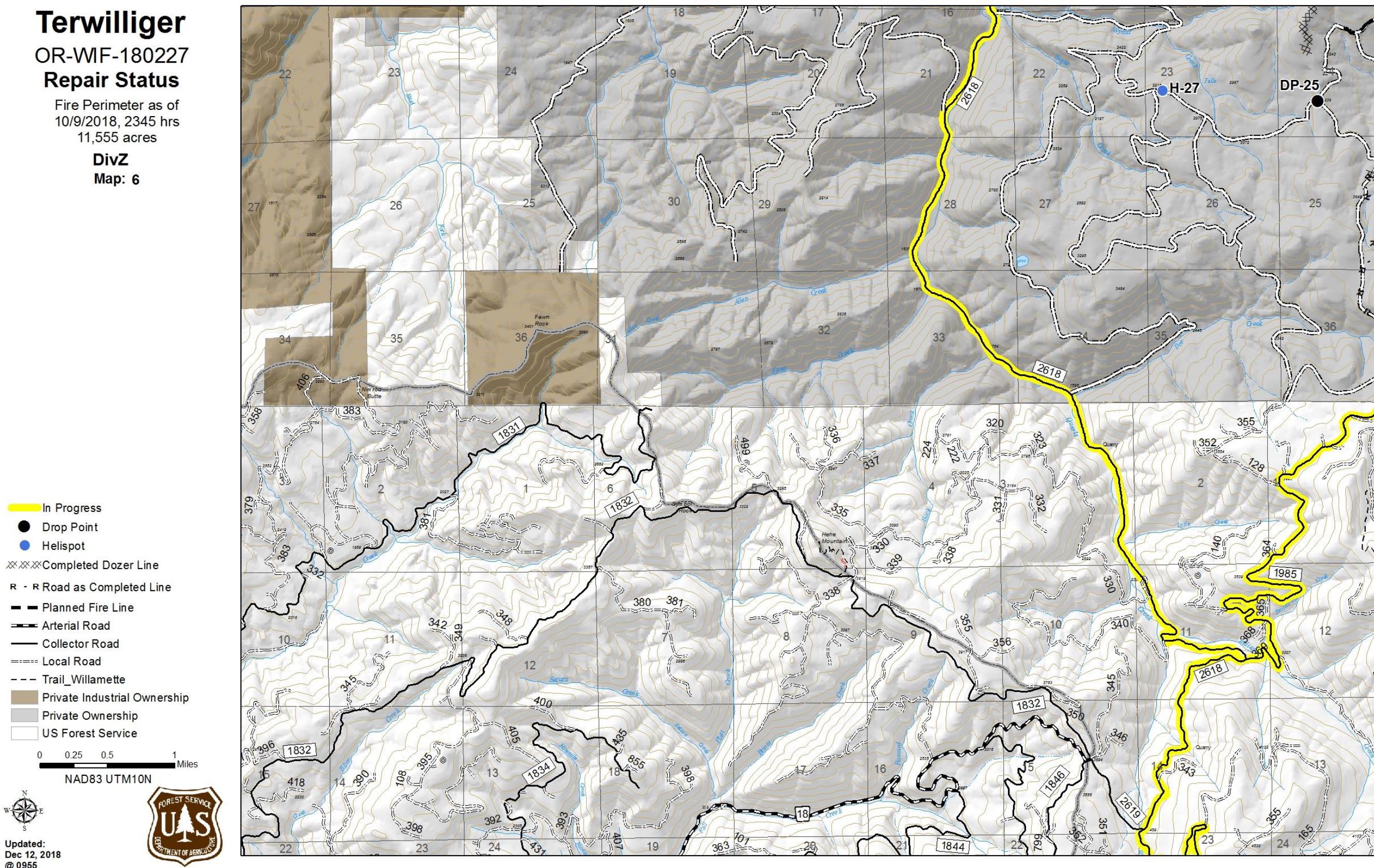
Terwilliger

OR-WIF-180227

Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivZ
Map: 6



Terwilliger

OR-WIF-180227

Repair Status

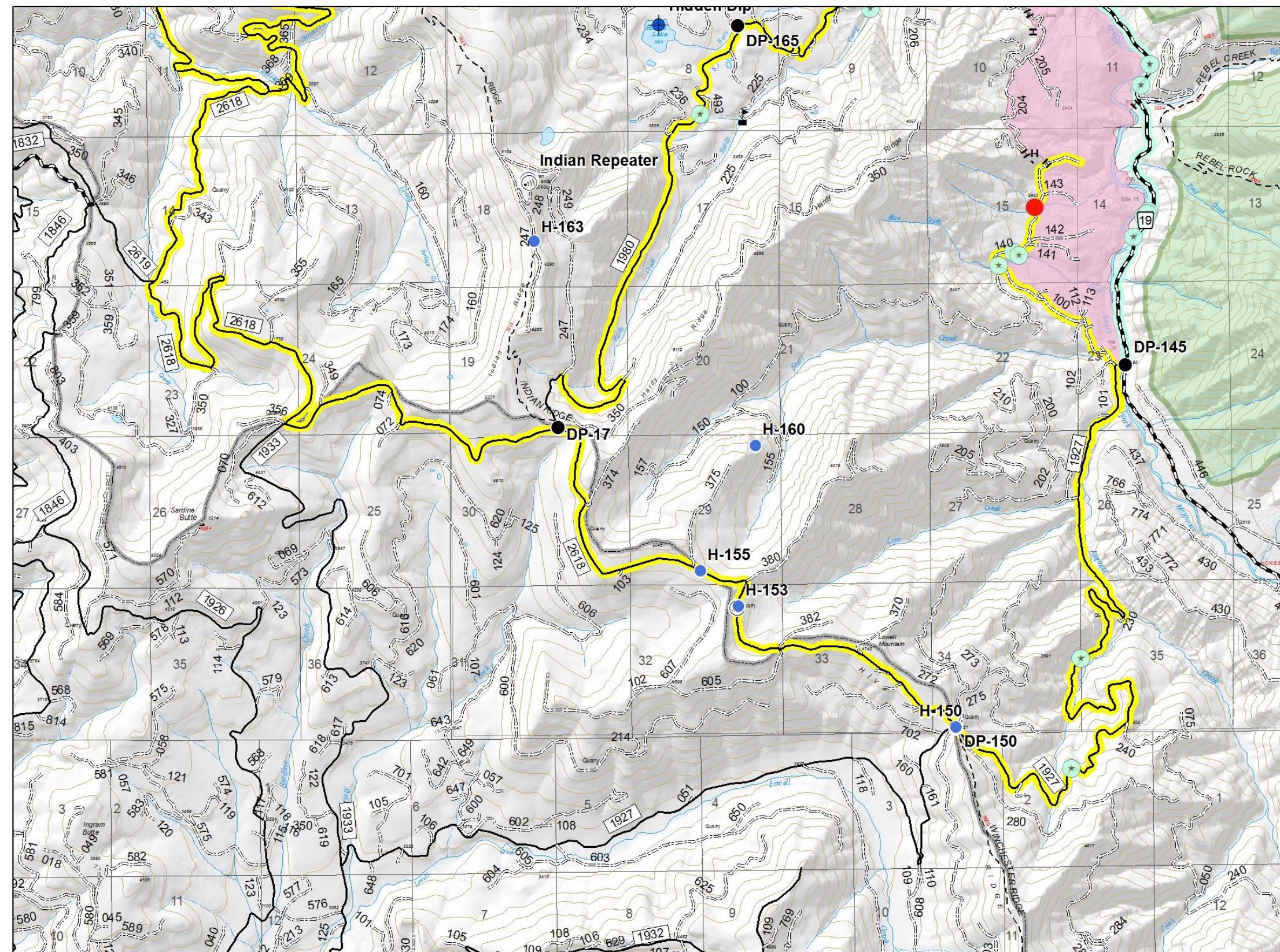
Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivZ
Map: 8

- District Repair
 - Repair Needed
 - District Repair
 - In Progress
 - Dip Site
 - Drop Point
 - Helispot
 - Internet Access
 - Repeater
 - Value at Risk
 - H - H Completed Hand Line
 - Arterial Road
 - Collector Road
 - Local Road
 - - Trail_Willamette
 - Wilderness
 - US Forest Service
- 0 0.25 0.5 1 Miles



Updated:
Dec 12, 2018
@ 0957



Terwilliger

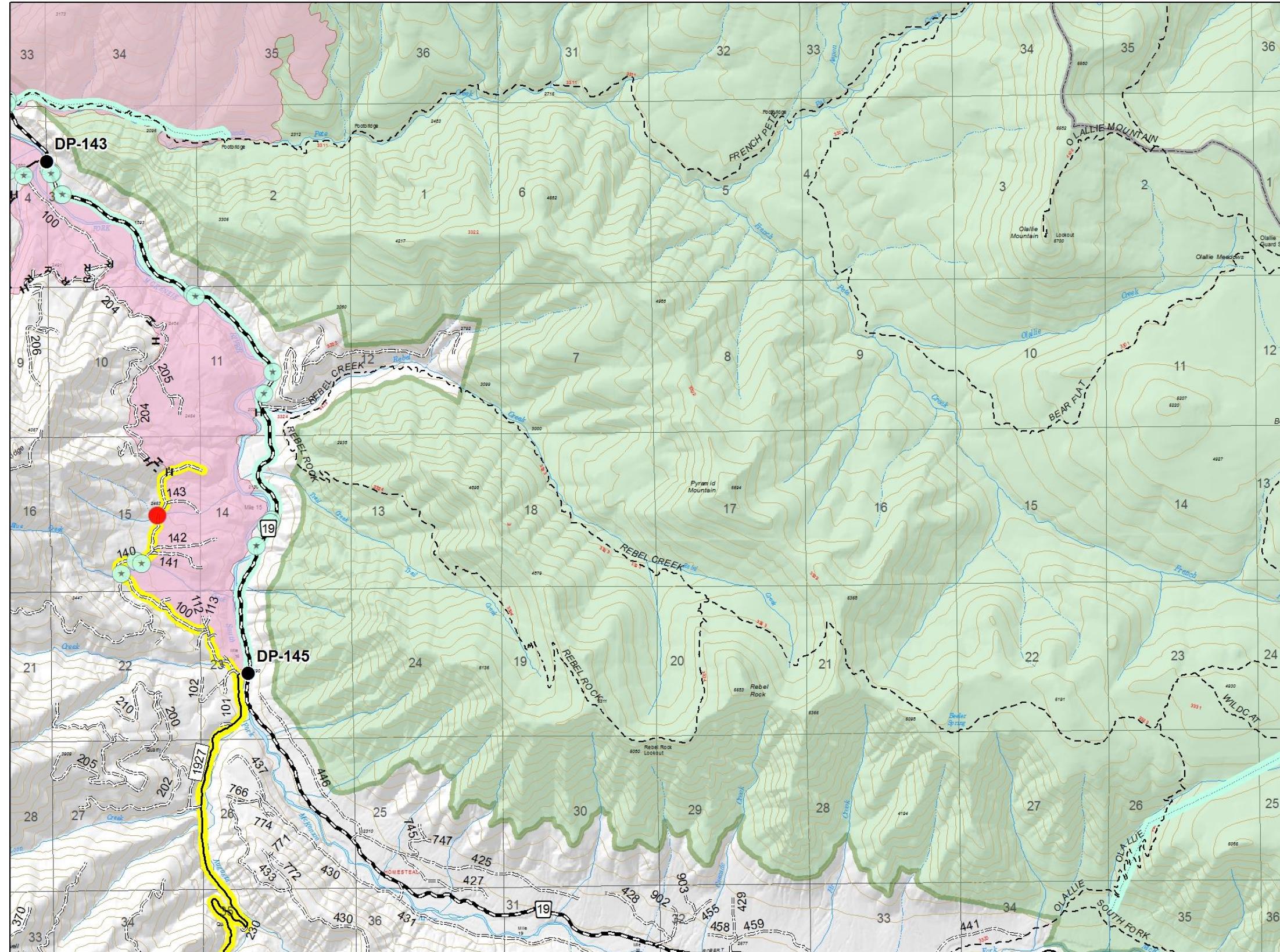
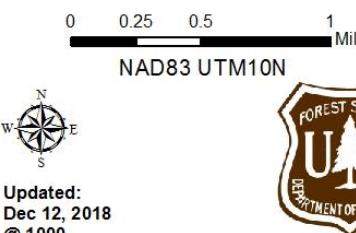
OR-WIF-180227

Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivZ
Map: 9

- District Repair
- In Progress
- Repair Needed
- District Repair
- In Progress
- Drop Point
- Value at Risk
- H - H Completed Hand Line
- R - R Road as Completed Line
- Arterial Road
- Collector Road
- Local Road
- - Trail_Willamette
- Wilderness
- US Forest Service



Terwilliger

OR-WF-180227

Repair Status

Fire Perimeter as of
10/9/2018, 2345 hrs
11,555 acres

DivZ
Map: 10

- District Repair
- District Repair
- In Progress

✗ Division Break

— Collector Road

===== Local Road

- - - Trail_Willamette

■ Wilderness

■ US Forest Service

0 0.25 0.5 1 Miles
NAD83 UTM10N



Updated:
Dec 12, 2018
@ 1001

